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PART II

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VOLUME XIII

FLORA OF PERU

PART II, No. 2

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FLORA OF PERU

J. Francis Macbride

41. CHLORANTHACEAE. Chloranthus Family

Reference: Solms in DC. Prodr. 16, pt. 1: 479–485. 1869.

Not only the articulate branchlets, enlarged at the nodes, but also the agreeable fragrance which Ruiz and Pavón describe accurately as seemingly emanating from the entire shrub, identify at once the members of this small family. The resin exuded appears as tear-shaped drops, with the color and odor of grains of the almáciga; in some places it is collected for the preparation of comforting poultices (Ruiz and Pavón).

1. HEDYOSMUM Sw.

Tafalla R. & P. Syst. 269. 1798.

Shrubs or small trees, always readily known by the opposite branchlets jointed at the nodes and by the more or less elongate, sheath-like, connate stipules. Flowers monoecious or dioecious, the staminate in ebracteate aments, the pistillate bracteate and capitate or cymose, the cymes often branched.—Several of the species are doubtfully distinct, but most of them are meagerly known. Some forms of *H. racemosum* are questionably separable from *H. arborescens* Sw., a species typically West Indian. It is a pity that the name *Tafalla* has not been conserved to commemorate the artist of the Ruiz and Pavón expedition, who collected so many of the specimens.

Aments and cymules small, 1–2 sessile in the axils of small leaves; leaves conspicuously scabrous beneath ..... *H. scabrum.*

Aments and cymules well developed, the latter several, spicate, paniculate, or capitate-congested.

Pistillate flowers in cymules, not capitate-congested.

Petioles 7–20 mm. long; leaves mostly 10 cm. long.

Cymules 6–8 mm. long, 3–4 mm. wide..... *H. Dombeyanum.*

Cymules smaller..... *H. racemosum.*

Petioles 3–8 mm. long; leaves mostly smaller.

Leaves ovate-elliptic or oblong-elliptic, bluntly pointed.

Branchlets scurfy; drupes 1.5–2 mm. long .. *H. Kanehirae.*

Branchlets glabrous; drupes 3–3.5 mm. long . *H. Huascari.*
Leaves oblong-lanceolate, acuminate..... *H. Lechleri.*
Pistillate flowers capitately congested; leaves oblong-lanceolate, coarsely serrate..... *H. glaucum.*

Hedyosmum Dombeyanum Solms in DC. Prodr. 16, pt. 1: 482. 1869.

Petioles 1–1.5 cm. long; leaf blades ovate-oblong, 7–10 cm. long, 2–3 cm. broad, subacuminate, obtusely callous-serrate, glabrous but somewhat scabrous and distinctly punctate above; cymules loosely paniculate, about 3-flowered, the bracts subequaling the ovate, trigonous drupes.

Huánuco: Cochero (*Dombey*).

Hedyosmum glaucum (R. & P.) Cordem. Adansonia 3: 303. 1863. *Tafalla glauca* R. & P. Syst. 271. 1798.

Branches stout, obtusely angled; leaves acuminate, 10–15 cm. long, rarely 3 cm. broad, glabrous; aments terminal, at first ovoid and 1.5–2 cm. long, becoming cylindric and 3 cm. long; fruiting inflorescence fleshy, to 3 cm. long and 2 cm. broad, the bracts linear, shorter than the lustrous, ovate, trigonous drupes. Neg. 8537.

Huánuco: Cochero and Acomayo, *Pavón.* "Aitacupi," "almáciga."

Hedyosmum Huascari Macbr. Field Mus. Bot. 11: 15. 1931.

Similar in foliage to *H. Kanehirae* but the cymules crowded in a spike 6–8 mm. long, and the slightly exserted, light brown drupes to 3.5 mm. long.—Named for one of the last kings of the Incas, Huascar.

Cajamarca: Above Tabaconas, 2,400 meters, *Weberbauer 6113,* type.—Amazonas: Chachapoyas, *Weberbauer 4353.*

Hedyosmum Kanehirae Macbr. Field Mus. Bot. 11: 14. 1931.

A tree about 5 meters high with densely scurfy-punctate branchlets having short internodes; leaves crowded, thick, the veins rather prominent beneath, the blades closely and minutely callous-crenate, dull, glabrous, oblong-elliptic-lanceolate, bluntly narrowed at the apex, up to 7 cm. long and 3 cm. wide but mostly smaller; petioles 3–6 mm. long; cymules approximate in short racemes, many of them sessile or nearly so, 4–5 mm. long and 3–4 mm. broad, the bracts nearly enclosing the finally black, subtrigonous, acute drupes, these

scarcely 2 mm. long.—The leaves are employed as a remedy for rheumatism (Kanehira).

Huánuco: Pan de Azúcar, *Sawada 64*, type. Monzón, *Weberbauer 3388*. Pampayacu, *Kanehira 115, 204*.

Hedyosmum Lechleri Solms in DC. Prodr. 16, pt. 1: 484. 1869.

Leaves glabrous, thinnish, oblong-lanceolate, acutely acuminate, remotely crenate-serrulate, 5–7 cm. long, 1.2 cm. broad, the veins obscure, even beneath; cymules in a contracted raceme or spike, about 5 mm. long; drupes pale brown, 3 mm. long, little exserted.

Puno: Talaxara (*Lechler 2632, 2660*). Sangabán, *Lechler 2279*.—Ayacucho: Carrapa, 1,500 meters, *Killip & Smith 22403*.

The Killip and Smith specimen, from a tree 7.5 meters high, is perhaps a distinct species, the cymules being 7–8 mm. long, the drupes included, 4 mm. long.

Hedyosmum racemosum (R. & P.) G. Don, Gen. Syst. 3: 434. 1834. *Tafalla racemosa* R. & P. Syst. 271. 1798.

A glabrous shrub or small tree with ample, chartaceous, more or less serrulate leaves; petioles in the type 7–10 mm. long but often 2 cm. long or longer; leaf blades lance-elliptic, acuminate, mostly 10–15 cm. long and 5–7 cm. wide; cymules in simple or nearly simple racemes or spikes; drupes in the type trigonous, rather bright (or reddish) brown, about 2 mm. long, exserted.—Solms recognizes *H. integrum* Cordem. Adansonia 3: 302. 1863, and *H. Sprucei* Solms in DC. Prodr. 16, pt. 1: 483. 1869 (Neg. 7831). The former is distinguished by exactly trigonous, well exserted drupes; the leaves are lustrous and the cymules paniculate. *H. Sprucei* is similar but the leaves are nearly dull and the pale drupes are well exserted. Possibly these are distinct species but they may be variants, their apparent differences being due, at least in part, to the degree of maturity. My No. 5798 was a slender tree 7 meters high with a bushy top. An infusion of the leaves in alcohol is used as a remedy for rheumatism (Weberbauer). The odor is that of bergamot (Raimondi) Neg. 7830.

San Martín: Zepelacio, 1,200 meters, *Klug 3273, 3746*. Tarapoto, *Spruce 4436* (*H. Sprucei* Solms!). Tarapoto, *Spruce 4311*. San Roque, 1,400 meters, *Williams 7006, 7500*.—Junín: Chanchamayo Valley, *Schunke 421, 481, 524, 525*. La Merced, 1,400 meters, *5798*. Pichis Trail, 1,500–1,900 meters, *Killip & Smith 25956*.—Loreto: Pumayacu, 600–1,200 meters, *Klug 3175*. Cerro de Escalera, *Ule 6583*.—Without locality: *Mathews 1994*.—Huánuco: *Haenke*

(det. Pilger). Monzón, *Weberbauer 3549;* 256. Río Posuso, 1,800 meters, *Weberbauer 6738* (det. Mansfeld).—Cajamarca: Cutervo, *Raimondi* (det. Krause).—Puno: Sandía, *Weberbauer 1112* (det. Krause); 278.—Ayacucho: Near Quillomito, 1,500 meters, *Weberbauer 7544.* Bolivia. "Anís," "supinum," "carpales," "asar guiru."

Hedyosmum scabrum (R. & P.) Solms in DC. Prodr. 16, pt. 1: 480. 1869. *Tafalla scabra* R. & P. Syst. 270. 1798. *H. latifolium* Cordem. Adansonia 3: 308. 1863.

Petioles 1–2 cm. long or longer; leaves elliptic-ovate, shortly obtuse-pointed, 8–12 cm. long, 4–6 cm. wide, coarsely callous-serrate, glabrous above, definitely scabrous and more or less hirsutulous beneath; aments and cymules in pairs, sessile, both in fruit to 10 mm. long.—Var. *Pavonii* Solms (Neg. 8535) has glabrous, acuminate leaves 3–4 cm. wide and shorter cymules. *H. Mandoni* Solms of Bolivia is to be expected. Its narrower leaves are densely and sharply callous-dentate. Neg. 7828.

Amazonas: Chachapoyas, *Raimondi* (det. Krause).—Cajamarca: Cutervo, *Jelski 101*; *Raimondi.* Chugur, *Weberbauer 4070, 4075* (det. Krause); 259, 260.—Cuzco: Prov. Convención, *Weberbauer 5894, 5893.*—Huánuco: Chinchao (*Rivero*). Muña and Pati, *Pavón.* Muña, 1,950 meters, *4111.* "Aytacupi." Colombia.

Doubtful Species

Hedyosmum angustifolium (R. & P.) Solms and *H. laciniatum* (R. & P.) Solms, DC. Prodr. 16, pt. 1: 485. 1869 (under *Tafalla* R. & P. Syst. 272. 1798) are essentially nomina nuda; no specimens have been found. Probably both are referable to *H. racemosum.*

42. SALICACEAE. Willow Family

Cultivated members of the family include, according to Herrera, *Populus tremula* L. as "álamo chileno" or "álamo temblón," for ornament or for the making of charcoal, and *Salix babylonica* L., the weeping willow, "sauce llorón," which, according to him, "has acclimated itself well in canyons of the Department of Cuzco, where it is used for decorations at funerals and religious fetes." *S. chilensis* develops into a stately tree in Cuzco and Apurímac (Weberbauer).

1. SALIX L. Willow

Apparently only two willows are native in Peru.

Salix chilensis Molina, Sagg. Nat. Chil. 169. 1782. *S. Humboldtiana* Willd. Sp. Pl. 4: 657. 1805.

Becoming a tree 10 meters tall or higher: leaves linear, acuminate, serrulate; stipules deciduous; catkins appearing with the leaves, the woolly bracts deciduous; capsules ovate, glabrous, the glabrous pedicels longer than the gland.—Ascending to more than 3,000 meters, cultivated only (Weberbauer 85). Illustrated, Mart. Fl. Bras. 4, pt. 1: *pl. 71*.

Cuzco: Particularly in the provinces of Urubamba, Calca, and Quispicanchi (*Herrera*). Huasao, 3,200 meters, *Herrera 3023*.—Arequipa: Region of Mt. Misti (Weberbauer 128, 129).—Ancash: Puccha Valley (Weberbauer 173). Huaraz (Weberbauer 172).—Junín: Tarma (Weberbauer 177).—Cajamarca: Ocros (Weberbauer 162). Marañón Valley (Weberbauer 174; 190).—Amazonas: Utcubamba (Weberbauer 192).—Lima: Barranco (Weberbauer 148). San Lorenzo Island near Callao, in 1852, *Andersson*. Huara, *Ruiz & Pavón; Dombey*.—Piura: (Weberbauer 150).—Huánuco, 2,100 meters, *3232*. Argentina and Chile to Texas and the West Indies. "Sauce."

Salix Martiana Leybold in Mart. Fl. Bras. 4, pt. 1: 227. *pl. 72*. 1885.

Similar to *S. chilensis* but the catkins looser, the scales of the staminate linear-lanceolate and entire instead of ovate, the capsules oblong, and the pedicels villous.—"Much less common on the Río Ucayali than on the Amazon; found only on the main stream and some of the chief tributaries. Nevertheless I found a few isolated examples in the great canyon of the Cerro de Canchahuaya" (Huber). This is probably the species reported by Ule, Bot. Jahrb. 40: 121–123, as *S. Humboldtiana*.

Loreto: Quebrada Grande del Cerro de Canchahuaya (*Huber 1328, 1564*). Florida, Río Putumayo, 200 meters, in forest, *Klug 2075;* a tree of 5 meters. Fortaleza, 200 meters, *Williams 4447*. Lower Río Nanay, river banks, *Williams 460*. Brazil. "Paharbubu."

43. MYRICACEAE. Bayberry Family

Reference: Chevallier, Mém. Soc. Sci. Nat. Math. Cherbourg 32: 85–340. 1901.

The pungent aroma that the resinous-glandular leaves or at least the berry-like, crowded fruits yield on slight pressure is a well-known character of this family, which is represented best in the northern hemisphere. The fragrant, whitish wax covering the fruits of certain northern species is sometimes largely replaced by or mixed with pubescence in the Peruvian species.

1. MYRICA L.

Nothing about these ament-bearing shrubs serves to distinguish them more readily, even at first glance, from other Peruvian amentiferous plants than the extraordinarily crowded and numerous leaves.

Leaves nearly oblong, about 1 cm. wide; plants dioecious.
M. Pavonis.

Leaves lance-obovate, about 2 cm. wide; plants monoecious.
M. pubescens.

Myrica Pavonis C. DC. in DC. Prodr. 16, pt. 2: 151. 1864; 287. *M. Pavonis* var. *glandulosa* Chev. op. cit. 288.

A slenderly branched shrub or small tree, the youngest parts canescent-pilose or puberulent; leaves scarcely narrowed to the obtuse tip, 5–7 cm. long, 6–10 mm. wide, short-attenuate to the slender petiole, more or less denticulate, resinous-glandular beneath; aments 1 cm. long; flower bracts ovate, acute, pubescent-margined, shorter than the flowers.—The type was from Guayaquil, by Ruiz and Pavón, who assigned an unpublished specific name referring to the Salix-like leaves, which simulate those of the common South American willow. Neg. 8538.

Lima: Canta (*Simm 88*).—Cuzco: Pillahuata, 2,400 meters, *Pennell 14026*.—Moquehua: Above Moquehua, 3,200 meters, *Weberbauer 7391, 7390* (det. Markgraf). "Huacán timbu."

Myrica pubescens Humb. & Bonpl. ex Willd. Sp. Pl. 4: 746. 1806; 289.

Robustly branched, the virgate branchlets and leaves more or less permanently pilose (rarely glabrous or glabrate), the latter resinous beneath; leaves 7–10 cm. long, 1.5–3 cm. wide, coarsely and sharply serrate or denticulate, acute or acuminate; aments often 3–6 cm. long; bracts awl-shaped, acuminate, pilose, exceeding the flowers; fruits nearly 5 mm. thick, wax-covered, tomentose (var. *tomentosa* Chev.) or glabrous (var. *glabra* Chev.).—Var. *glandulosa* Chev. is glabrous or nearly so, but the young fruits are tomentose, becoming waxy. The young fruits of my No. 3484 were citrous-aromatic. "When one takes a bit of the pulverized bark of this shrub in place of tobacco, one sneezes 10 or 12 times; the powder does not irritate or damage the nose, and after cleaning with the handkerchief the sting and the sneezing cease; experiment has shown that this cleans out the head and relieves migraine" (Ruiz & Pavón). Weberbauer determinations by Markgraf. Illustrated, Denkschr. Akad. Wiss. Wien 15: *pl. 4* (as "*tinctoria*"). Negs. 11553, 25097.

Cajamarca: Huambos, 3,000 meters, *Weberbauer 4160, 4187;* 260 (under an unpublished name).—Libertad: Chicama, 1,600 meters, *Weberbauer 6986* (var. *tomentosa*).—Ancash: Huaraz, 3,200 meters, *Weberbauer 3245* (var. *glandulosa*). Tallenga, Prov. Cajatambo, 3,600 meters, *Weberbauer 2890* (var. *glandulosa*); 179 (under an unpublished name).—Junín: Huacapistana, 2,500 meters, *Weberbauer 2192; Killip & Smith 24519* (3–5 meters high).—Huánuco: Cani, near Mito, dense shrub or tree of grassy slopes, 2,550 meters, *3484* (det. Killip as a glabrate form).—Lima: Canta (*Rivero;* var. *tomentosa*).—Ayacucho: Between Tambo and Río Apurímac, 2,900 meters, *Weberbauer 5587.*—Cuzco: Urubamba, 1,800 meters, *Weberbauer 5057;* 245 (det. Schellenberg). Marcapata, 3,200 meters, *Weberbauer 7784.* Convención, *Weberbauer 5057* (fruits white-waxy). Peru to Venezuela and Costa Rica. "Laurel," "tuppassaire," "ssaire."

44. JUGLANDACEAE. Walnut Family

Only the black walnut or "nogal" represents this economically important family in Peru.

1. JUGLANS L. Walnut

Reference: Dode, Bull. Soc. Dendr. France 4: 165–215. 1909.

Georges H. Barrel, Trop. Woods 10: 51–53, has given an account of his personal observation of "nogal" in Peru. He noted it as rather common on the upper reaches of the Río Ucayali, along the Pichis Trail and in the Chanchamayo Valley, as the following citations bear witness. He found that the native people recognized a "nogal blanco" and a "nogal negro." Weberbauer and later Williams recorded it from the Department of Amazonas, the former giving its altitudinal range in the valleys of the north as 1,600–2,000 meters, and on the eastern slopes in the rain forest as between 800 and 1,000 meters. Herrera has recorded it from Cuzco. Barrel found the individual trees rarely clustered, often scattered, which in spite of their great timber value (the wood is highly prized for fine construction) makes their lumbering expensive. Botanists have reported the tree as "plentiful" near Chachapoyas, but probably not from a lumberman's standpoint. Apparently the tree usually branches at 3–5 meters though trees have been reported to 30 meters high that branched at 10 meters with a trunk 1 meter in diameter below. Walnut is valued locally not only for its wood but also for a dye made from a decoction of the bark, leaves, and fruit. According to Herrera, *Juglans regia* L., the English walnut, is cultivated in Cuzco,

the nuts being known as "nueces de Chile." The "nogal de la tierra" identified by Ruiz and Pavón as *J. nigra* L., cultivated at Chancai for its timber and nuts, has been determined by Markgraf as *J. neotropica* Diels. Williams, Trop. Woods 27: 16–17, has added his observations to those of Barrel and Weberbauer, upon which I have drawn in part.

I have not seen Dode's types, and separate the Peruvian material studied on the basis of the following key with great misgiving, feeling that the differences noted represent only individual variations or races. The problem can be solved only by abundant flowering and fruiting material from marked trees, since examination of the types alone cannot prove much. Practically, there is one acceptable name for the walnut of Peru (sens. lat.), *Juglans neotropica* Diels. The other names and descriptions are given for reference convenience, as the opportunity for further study of the problem may present itself.

Bractlet (staminate) 3–3.5 mm. long, borne under the perianth; leaves (at least at flowering time) densely pilose beneath; stigmas fleshy, short; young fruits densely pubescent; fruit cells 6–8 ..... *J. neotropica.*

Bractlet reduced to a woolly tuft on the pedicel; leaves at flowering time densely pubescent, especially beneath; stigmas slender; young fruits densely pubescent; lateral fruit cells 4 ... *J. Honorei.*

Bractlet minute, at the base of the receptacle; leaves soon glabrous or nearly so, the youngest minutely granular-puberulent; stigmas slender; young fruits sparsely pubescent; fruit cells 6–8. *J. peruviana.*

Juglans Honorei Dode, Bull. Soc. Dendr. France 4: 205. 1909.

Leaflets 6–15 pairs, ovate-lanceolate, unequally rotund-subcordate at the base, more or less abruptly acuminate, regularly serrate, scabrous-pubescent on both sides, the rough, branched hairs more numerous beneath (in youth densely velvety beneath); staminate aments to 20 cm. long, 1.5 cm. wide; perianth 6–8-lobed, with a 2-lobed involucre; anthers 60–70, pubescent at the tip; bractlet reduced to a rusty tuft of wool at about the middle of the pedicel; pistillate flowers 5–8; stigmatic branches slender; fruit subglobose-subconic, 4–5 cm. long, densely villous; nut rather remotely and obtusely rugose-costate, depressed at the base, subconic, scarcely compressed, to 3.5 cm. high.—A tree of 25 meters or taller. The native name of "tocte" is recorded by Spruce. In Peru known only

from cultivation, but the cultivated specimen by Pavón in Herb. Madrid is determined by Markgraf as *J. neotropica* and, though sterile, probably is; the leaves are not truly scabrous but densely pubescent, especially on the veins beneath. Fruit illustrated, Dode, op. cit. *pl.* opp. p. 178, from nuts supplied by M. Honoré of Lima; leaves in plate on p. 169.

Lima: Cultivated (*Pavón*). Ecuador; Colombia.

Juglans neotropica Diels, Bot. Jahrb. 37: 398. 1906.

A tree to 30 meters high, the stout young branchlets, especially at tip, and the leaf rachis at flowering time conspicuously rusty-pubescent; leaflets 7–8 pairs (–14 according to Dode), at first above sparsely, beneath densely velvety-pubescent, the largest middle leaflets about 12 cm. long and 4 cm. wide, gradually long-acuminate, minutely and evenly serrate; staminate aments 20–25 cm. long, the flowers partly remote, partly approximate; bractlets 2–3.5 mm. long, yellowish-brown-pilose; anthers apically pubescent; pistillate flowers 3–10; calyx urceolate, rusty-tomentose, 18 mm. long, 6–7 mm. broad, the narrow, reflexed teeth unequal, the larger 5 mm., the smaller 2 mm. long; perianth segments 4, reflexed, irregularly dentate, 6 mm. long, 3–4 mm. wide; stigmatic branches broadly lingulate, densely papillose, 8–9 mm. long, 4 mm. broad.—Dode associates somewhat doubtfully with this species nuts collected by Ruiz and Pavón at Huánuco and figures them, op. cit. opposite p. 180. They are ovoid, about 4 cm. high, 3.5 cm. thick, moderately rugose, pointed, at base rounded, with 8 subelliptic cells. The Raimondi specimen is much less pubescent than the type. See also *J. peruviana*. Illustrated, Weberbauer, *pl. 13* opposite p. 199. Neg. 18254.

Amazonas: Moyabamba, 2,700–3,300 meters, *Williams 7606*. Chachapoyas, 2,700 meters, *Williams 7563*. Utcubamba, near Chachapoyas, 2,000 meters, *Weberbauer 4304*, type.—Lima: Cultivated at Lima and Chancai, *Ruiz & Pavón* (det. Markgraf); "nueces de la Trexna," "nogal."—Cajamarca: Chirinos, *Raimondi* (det. Markgraf).—Huánuco: Posuso, 900 meters, *Weberbauer 6753*.—Ayacucho: Río Perené, 900 meters, *Weberbauer 5632* (det. Nagel).—Cuzco: Prov. Convención, Santa Ana and Marcapata (*Herrera*). "Nogal."

Juglans peruviana Dode, Bull. Soc. Dendr. France 4: 208. 1909.

Separated by the author from *J. Honorei* by the larger fruits, these globose-subconic, at least 5.5 cm. thick, and especially by the more numerous fruit cells, these 6–8 and occupying a very large

space, particularly the basal ones; other characters given in the above key are taken from *Weberbauer 6753*, with no ripe fruits. This collector's *5632* may be the same. In view of the known variation in walnut fruits, *J. peruviana* is probably only a form of *J. Honorei*, as Dode suggests; in this case the aberrant Weberbauer material is to be taken merely as showing the range of variation in the unit *J. neotropica*, which compare for citation of above collections.—Very similar is *J. boliviana* (C. DC.) Dode (*J. nigra* L. var. C. DC.), the strongly ribbed nuts to 6 cm. high and the leaflets of the large leaves acuminate and unequal at base.

Lima: Apparently collected by M. Honoré (type).

45. JULIANIACEAE. Juliania Family

One of the two genera that constitute this interesting family, a group placed by Hemsley between the Juglandales and the Fagales, is exclusively Peruvian. In foliage, in the presence of resin, in the exalbuminous seed, and anatomically it resembles the Anacardiaceae, but its resemblances with the Juglandaceae may be more fundamental, as for example the dissimilarity of the staminate and pistillate flowers. Rendle in his *Classification of Flowering Plants* follows Hemsley, but some botanists, as Standley in his *Trees and Shrubs of Mexico*, place it next to the Anacardiaceae.

1. ORTHOPTERYGIUM Hemsl.

Reference: Hemsley, Phil. Trans. Roy. Soc. London, Ser. B. 199: 169–197. 1907.

A shrub or small tree with dioecious flowers borne rather densely at the tips of the stout branchlets before or with the leaves. Leaves unequally pinnate. Fruit a samara, consisting of the persistent involucre borne on the solitary, wing-like stalk of the inflorescence, the wing straight and equal-sided.—Asa Gray aptly likens the fruit to that of the ash (*Fraxinus*) inverted.

Orthopterygium Huaucui (Gray) Hemsl. op. cit. 190. *Juliania Huaucui* Gray, Bot. U. S. Expl. Exped. 1: 371. 1854.

Leaves at first tomentose, becoming glabrate above, usually 7-foliolate; petioles several cm. long; leaflets crenulate, oblongish, about 1 cm. long; samaras pendulous, 11 cm. long, 8–10 mm. wide. —The species name records incorrectly the vernacular name. Seldom seen without leaves, and always black as if burned or blasted (MacLean). The Weberbauer collections determined by Schellenberg. Illustrated, Hemsley, op. cit. *pl. 24*.

Lima: Covering the sides of the base of the Cuesta de Purruchuca, Prov. Canta, in 1831 (*Mathews 591*, type); (*MacLean*, presumably the type locality). Yanga (*Wilkes Exped.*). Chosica, 1,600–1,900 meters, *Weberbauer 5362, 5719, 5721, 5681, 5681a;* at 900 meters, rocky hillside, *2866*. Río de Lomas, 1,000 meters, *Weberbauer 5741*.—Ica: Above Pisco, Huauyanga-Pampano, *Weberbauer 5371, 5372, 5373*.—Ayacucho: Coracora, 2,800 meters, *Weberbauer 5818*. "Huancui," "huanarpu."

46. BETULACEAE. Birch Family

Reference: Winkler, Pflanzenreich IV. 61. 1904.

1. ALNUS L. Alder

The alder is one of the most important trees of the Peruvian Andes because it ascends to altitudes (3,500–3,800 meters, according to Weberbauer) where it is especially valuable for fuel and for small construction. It is sometimes planted. Herrera has recorded some form (erroneously as *A. acuminata* HBK.) as "cultivated in great abundance in all the *quebradas* of the Department of Cuzco, its wood greatly valued for all construction purposes." Ruiz and Pavón found *Betula alba* L. cultivated about the convent at Huerta de Ocopa near Tarma, one example having nine very tall trunks. Weberbauer has reproduced a good photograph of the Peruvian alder, showing it in a typical situation—Pflanzenw. Peru. Anden, opposite p. 295.

Alnus jorullensis HBK. Nov. Gen. & Sp. 2: 20. 1817; 126.

Typically Mexican, var. *typica* Regel having elliptic-oblong leaves 5–10 cm. long and 2.5–5 cm. wide, pale rusty-pubescent beneath, this variable species is represented in Peru by several variations, two of which are well marked: var. *castaneifolia* (Mirb.) Regel (*castaneaefolia*) with glabrous (or pubescent in the nerve axils), ovate-lanceolate leaves 8–10 cm. long and 1.5–3 cm. wide, or larger on the sterile shoots; and var. *ferruginea* (HBK.) Kuntze, with ovate leaves 10 cm. long and 3–6 cm. wide, or twice as large on young branches, these and the prominent leaf nerves beneath rusty-pilose. Scarcely distinguishable from the last are vars. *Mirbelii* (Spach) Winkl. and *acutissima* Winkl., the former with coarsely serrate leaves, glaucous and pale rusty-pubescent beneath, the latter with ovate, acutely acuminate, denticulate leaves having the 13–18 nerves impressed above but prominent and pilose beneath.

Ruiz and Pavón collected the tree at Pillao and Chacahuasi, noting that an infusion of the inner bark tans leather and dyes cotton and wool a cinnamon-brown; the leaves crushed with butter cicatrize wounds and without fat protect against inflammation; applied to recent wounds the leaves stop bleeding.—Illustrated, Mém. Mus. Paris 14: 463. *pl. 21, 22;* vars. *castaneifolia* and *Mirbelii*, Sargent, Sylva N. Amer. 9: *pl. 457.* Neg. 11652.

Cajamarca: Huaraz, 2,200 meters (Weberbauer 172, 179).—Ancash: Caracha, 1,200 meters, *Weberbauer 2650;* 162, 168. Samanco (Weberbauer 171).—Amazonas: Utcubamba (Weberbauer 192).—Huánuco: Fifteen miles southeast of Huánuco, *2083.* Huánuco, *Kanehira 34.* Mito, 2,700 meters, *1527, 1907.* Pillao, *Ruiz & Pavón* (var. *castaneifolia*, det. Mildbraed). Chancai, Huánuco, and Cochero, *Ruiz & Pavón* (var. *ferruginea*, det. Mildbraed). Huánuco Valley, *Poeppig* (var. *acutissima*).—Lima: Matucana, 2,400 meters, *561; Weberbauer 182* (var. *acutissima*).—Junín: Tarma, *Esposto;* at 3,600 meters (Weberbauer 177, 183); at 2,100 meters, *1021.* Huancayo, *Esposto.* Carpapata, edge of forest, 2,700–3,200 meters, *Killip & Smith 24480;* a tree of 4.5–7.5 meters. Ocopa, 3,300 meters, *Killip & Smith 22008;* a tree of 6–12 meters, by roadside.—Cuzco: Río Apurímac, 2,800 meters, *Weberbauer 5892* (det. Schellenberg). Urubamba, 2,800 meters (Weberbauer 174, 182, 243). Prov. Quispicanchi, 3,200 meters, *Herrera 650* (var. *acutissima*, det. Mansfeld). Calca, Valle del Urubamba, 3,000 meters, *Herrera 2092.*—Libertad: Valley of Río Mixiollo, 2,400 meters, *Weberbauer 7040.*—Puno: Sandía, 3,200 meters (Weberbauer 184). Tabina, *Lechler 1891* (var. *Mirbelii*, fide Winkler).—Without locality, *Weberbauer 7040.* Argentina and Bolivia to Mexico. "Aliso," "ramram," "lambrán."

47. ULMACEAE. Elm Family

By Charles Baehni

The Peruvian plants of this family all belong to the Celtideae, a group in which the fruit is a drupe containing a curved embryo, a character not found in the rest of the family.

Stamens as many as the perianth segments.

Leaves alternate.

Stamens deciduous, included in the minute flowers; leaves precocious.

Staminate flower segments induplicate-valvate, the pistillate deciduous.....1. *Trema.*

Staminate flower segments imbricate, the pistillate persistent. 2. *Celtis.*

Stamens persistent; leaves appearing after the flowers. 3. *Plagioceltis.*

Leaves opposite ..... 4. *Lozanella.*

Stamens twice as many as the perianth segments ..... 5. *Ampelocera.*

1. TREMA Lour.

Sponia Comm. ex Lam. Encycl. 4: 139. 1797.

Scarcely distinct from *Celtis*, the flowers sometimes perfect and with somewhat imbricate segments. Perianth persisting around the drupe.—Species poorly understood or very variable in pubescence and size and discoloration of leaves; cf. Planchon in DC. Prodr. 17: 203, under *Sponia*.

Trema micrantha (L.) Blume, Mus. Bot. Lugd. Bat. 2: 58. 1853. *Rhamnus micranthus* L. Syst. ed. 10. 937. 1759. *Celtis micranthus* Sw. Prodr. 53. 1788. *Sponia micrantha* Dcne. Nouv. Ann. Mus. Paris 3: 498. 1834. *C. Lima* Sw. loc. cit., non Lam. *C. canescens* HBK. Nov. Gen. & Sp. 2: 28. 1817. *C. canescens* Dcne. op. cit. *C. macrophylla* HBK. op. cit. 30. *S. macrophylla* Dcne. op. cit. *T. canescens* Blume, op. cit. *S. peruviana* Klotzsch, Linnaea 20: 536. 1847. *S. Chichilea* Planch. Ann. Sci. Nat. III. 10: 334. 1849 (not 1848 as usually cited). *T. Chichilea* Blume, op. cit.

An unarmed tree, usually a few meters tall; trunk sometimes 20–40 cm. in diameter; leaves usually lanceolate, acuminate, minutely serrulate, 3-nerved, more or less scabrous above, merely scabrous or glabrate to densely and softly pilose beneath, about 10 cm. long; flowers greenish white, red to fiery red (Weberbauer).—The above synonymy is partial, applying to Peruvian specimens cited or found in herbaria. Illustrated, Fawc. & Rendle, Fl. Jamaica 1: 39. Negs. 25569 (*T. Chichilea*), 11238 (*T. canescens*).

Cuzco: Santa Ana, 1,200 meters, *Weberbauer 5038*. Río Pachaca, 1,100 meters, *Weberbauer 5887*. Machupicchu, 2,200 meters, *Herrera 3240*.—Huánuco: Monzón, 900 meters, *Weberbauer 3433*. Casapí, *Mathews 2038*. Cochero, *Poeppig 155, 1247*. Pampayacu, *Kanehira 192*. Vilcabamba, 1,800 meters, *5132*.—Lima(?): Quebrada de Pariahuanca (*Mathews 829*, var. of *canescens* acc. to Planchon).—San Martín: Tarapoto, *Spruce 4242*. Near Moyobamba, 1,110 meters, *Klug 3261* (det. Standley). Lamas, 840 meters, *Williams 6446*. Cumbasa, *Williams 5765*. San Roque, *Williams 7376*.—

Loreto: Florida: Río Putumayo, 180 meters, *Klug 2144* (det. Standley). Lower Río Huallaga, *Williams 5006*. Mouth of Río Santiago, *Tessmann 4431*. Yarina-cocha, *Tessmann 3227* (glabrate), *3227a* (pilose). Río Nanay, *Williams 368, 366*. Río Santiago, 200 meters, *Mexia 6308, 6238*. La Victoria, *Williams 3088, 2591*. Fortaleza, 200 meters, *Williams 4225*. Río Masana, *Williams 194, 80*. Puerto Arturo, 135 meters, *Killip & Smith 27860; Williams 5152*. Pebas, *Williams 1759*. Pinto-cocha, *Williams 811*. Soledad, 110 meters, *Killip & Smith 29778*. Mishuyacu, 100 meters, *Klug 1314*. Iquitos, *Killip & Smith 27387*. Punchana, *Williams 3755*.—Junín: Colonia Perené, 680 meters, *Killip & Smith 25021*. Chanchamayo Valley, 1,500 meters, *Schunke 201*. Above San Ramón, 1,400–1,700 meters, *Killip & Smith 24621*. La Merced, 600 meters, *5229*.—Without locality; *Ruiz & Pavón* (type of *T. Chichilea*); *Dombey; Pavón*. Widely distributed in tropical and subtropical America. "Aisegerina" (Huitoto name), "atadijo," "yana-caspi."

2. CELTIS L.

References: Planchon, Ann. Sci. Nat. III. 10: 309, 1849; Miquel in Mart. Fl. Bras. 4, pt. 1: 173. 1853; Planchon in DC. Prodr. 17: 186. 1873; Baehni, Candollea 7: 189. 1936.

Trees, shrubs, or lianas, usually armed with small, inconspicuous flowers in axillary clusters or cymes. Perianth 4–5-lobed, deciduous. Stigma divided into 2 branches to the base, sometimes each branch again 2-cleft. Fruit a drupe.—The number of described species is rather high. It seems, however, that they all belong to a few well defined groups which are considered here as species. Ruiz and Pavón record the name "chichillica" for an unindentified species from Muña, the bark of which was used for coarse basketry and for cords. This reference may well refer to *Trema micrantha*.

Adult leaves (except on the nerves) glabrous or practically so.

Fruit large (6–12 mm. in diam.); young leaves sericeous. *C. triflora.*

Fruit small (4–6 mm. in diam.); young leaves pilose.....*C. iguanea.*

Adult leaves pubescent.

Inflorescence well developed (3 cm. long or more).....*C. dichotoma.*

Inflorescence short or glomerulous.....*C. pubescens.*

Celtis dichotoma (Klotzsch) Miq. in Mart. Fl. Bras. 4, pt. 1: 182. 1853. *Momisia dichotoma* Klotzsch, Linnaea 20: 539. 1847. *C. Pavonii* Planch. Ann. Sci. Nat. III. 10: 313. 1849.

Branchlets, petioles, and young leaves beneath densely covered with an indument of golden yellowish (sometimes rusty) hairs; spines wanting or very short; leaves ovate or oblong-ovate, acute or acuminate, cordate, entire or coarsely dentate toward the apex, glabrate in age beneath; staminate inflorescences many-flowered, many times longer than the petioles.—Fruits large, globose, glabrous, yellow and sweet, and (according to Ruiz and Pavón) eaten by the Indians. Negs. 11739, 25566 (*C. Pavonii*).

Huánuco: Chacahuasi, Posuso, etc., *Ruiz & Pavón.*

Celtis iguanea (Jacq.) Sarg. Silva 7: 64. 1895. *Rhamnus iguaneus* Jacq. Enum. Pl. Carib. 16. 1760. *C. aculeatus* Sw. Prodr. 53. 1788. *Mertensia laevigata* HBK. Nov. Gen. & Sp. 2: 31. 1817.

A small tree, a shrub, or a liana, glabrous or essentially so except for some evanescent pubescence on the young branchlets and leaves beneath, usually armed, the spines well developed, geminate; leaves ovate or oval-elliptic, entire or remotely serrate toward the tip, the young ones pilose, glabrous in age; cymes short, rarely two or three times longer than the petioles; fruit small, 4–6 mm. in diameter.—Illustrated, HBK. Nov. Gen. & Sp. 2: *pl. 103.*

San Martín: Tarapoto, *Spruce 4236.* Alto Río Huallaga, *Williams 6756.* Near Moyobamba, *Klug 3303.* Tarapoto, *Williams 6666.* Juan Guerra, 720 meters, *Williams 6846.* Lamas, 840 meters, *Williams 6357.* Rumizapa, *Williams 6784.*—Loreto: Yarina-cocha, *Tessmann* 3428. Mishuyacu, 100 meters, *Klug 1435.* Paraíso, 145 meters, *Williams 3365.*—Junín: La Merced, 700 meters, *Killip & Smith 24079.*—Piura: Serrán, *Weberbauer 6000.*—Túmbez: Between Ricaplaya and Casa Blanqueada, *Weberbauer 7741.* A species widely distributed in South and Central America, West Indies, and north to Mexico and Florida. "Palo blanco," "meloncito blanco."

Celtis pubescens (Humb. & Bonpl.) Spreng. Syst. 1: 931. 1825. *Mertensia pubescens* Humb. & Bonpl. in Schult. Syst. 6: 312. 1820. *Mertensia brasiliensis* Gardn. Lond. Journ. Bot. 2: 339. 1843. *Momisia brevifolia* Klotzsch, Linnaea 20: 538. 1847. *C. boliviensis* Planch. Ann. Sci. Nat. III. 10: 310. 1849. *C. velutina* Planch. op. cit. 313. *Momisia flexuosa* Wedd. Ann. Sci. Nat. III. 18: 194. 1852. *M. crenata* Wedd. op. cit. 195.

A tree, a shrub, or a liana, with flexuous branchlets, the young twigs puberulous or velvety, armed with straight or slightly curved, paired spines; leaves ovate or elliptic-ovate, acute or acuminate, cordate or rounded at the base, entire or serrate toward the tip, the

young ones often with golden hairs, in age glabrous above, softly pubescent beneath; cymes short, not much longer than the petioles; fruit small, glabrescent, rough when dry.—The synonymy above is partial, applying to Peruvian specimens only. Negs. 29617 (*crenata*), 29664 (*pubescens*).

Junín: Huancayo, *Raimondi 9177.* Between Sandía and Chunchusmayo, Azalaya, *Weberbauer 1126.* Chanchamayo, *Isern 2322.* La Merced, 600 meters, *5438, 5280; Killip & Smith 24042, 23406.*—San Martín: Juan Guerra, 720 meters, *Williams 6871.*—Río Acre: *Ule 9334.*—Lima(?): Quebrada de Pariahuanca, *Mathews 826.*—Huancavelica: On the Montaro, upstream from Colcabamba, *Weberbauer 6437.*—Cajamarca: Prov. Contumaza, Cascas, *Raimondi 7973.* Tropical South America, widely distributed.

Celtis triflora (Klotzsch) Miq. in Mart. Fl. Bras. 4, pt. 1: 181. 1853. *Momisia triflora* Klotzsch, Linnaea 20: 537. 1847. *C. glycycarpa* Mart. ex Miq. op. cit. 174.

Branches and branchlets glabrous or evanescently pilose, brownish, the stout spines mostly solitary, slightly curved; leaves ovate or oblong-elliptic, acuminate, subcordate or cordate, entire or serrate toward the tip, asperous above, glabrescent beneath; fruit large, globose, smooth.—A tree, up to 12 meters high.

Huánuco: Posuso, *Ruiz & Pavón.*—Loreto: Mouth of Río Santiago, Pongo de Manseriche, *Tessmann 4274.* Bolivia; Brazil; Venezuela.

3. PLAGIOCELTIS Mildbr., gen. nov.

A stoutly branched shrub with light yellowish brown bark. Leaves appearing with the flowers, or immediately after. Racemes terminal or nodal on the leafless branches of the preceding year.

Plagioceltis dichotoma Mildbr. in Herb. Madrid, sp. nov.

Frutex racemis atque ramulis novellis exceptis glaber; folia juvenilia 5 mm. longe petiolata tenuia subelliptica remotissime dentata acuta basi attenuata ad 7 cm. longa et ultra; racemi saepe 1-ramosi, bracteolis subrotundis; flores circa 2 mm. longi, sepalis rotundatis, staminibus persistentibus; ovarium pilosum, stylo staminibus longiore.

Glabrous except for the evanescently puberulent growing branchlets and racemes, the latter often once branched, 1–1.5 cm. long; petioles 5 mm. long; leaves (young) thin, very remotely toothed, subelliptic, attenuate at the base, acute, to 7 cm. long or longer;

bractlets roundish; flowers about 2 mm. long, the pilose ovary soon exserted with the conspicuous style from the persistent stamens and roundish petals.—Description from type in Herb. Madrid.

Without locality: *Ruiz & Pavón.*

4. LOZANELLA Greenm.

Unarmed trees or shrubs with opposite, serrate leaves and dioecious inflorescences; fruit a small drupe containing a curved embryo with oblong-rotund, scarcely curved cotyledons.—The two species of this genus are readily distinguished from all other members of the Ulmaceae on account of their opposite leaves.

Adult leaves not densely pubescent beneath; pistillate inflorescence conspicuously branched.....*L. enantiophylla.*

Adult leaves densely pubescent beneath; pistillate inflorescence with short lateral branches.....*L. permollis.*

Lozanella enantiophylla (Donn. Smith) Killip & Morton, Journ. Wash. Acad. Sci. 21: 14: 339. 1931. *Trema enantiophylla* Donn. Smith, Bot. Gaz. 33: 339. 1902. *L. trematoides* Greenm. Proc. Amer. Acad. 41: 236. 1905.

A small tree, 3–7 meters high, or a shrub, with long-petioled, ovate to oblong-ovate, leaves, united, deciduous stipules, and open, much branched cymes.

Libertad: Prov. Pataz, Rio Mishiolla Valley, 2,000 meters, *Weberbauer 7049.* Mexico, Guatemala, Colombia.

Lozanella permollis Killip & Morton, Journ. Wash. Acad. Sci. 21: 338. 1931.

A tree up to 8 meters high, the young branchlets covered with densely matted hairs; leaves oblique at the base, elliptic, densely covered on the veins beneath with long, appressed hairs; fruit a small drupe, the styles persistent.

Cuzco: Lucumayo Valley, *Cook & Gilbert 1376.* This species has been collected several times in Bolivia.

5. AMPELOCERA Klotzsch

Reference: Klotzsch, Linnaea 20: 542. 1847.

An unarmed shrub with remotely serrate, pinnately nerved leaves. Flowers articulate, in axillary racemes, mostly geminate, corymbose, polygamous, perfect, or staminate by the abortion of the ovary. Filaments filiform, exserted. Ovary ovate, the stigma

deeply 2-parted, the subulate branches divaricate; ovule pendulous, the micropyle superior. Seed arcuate.—The following species is the type of the genus, to which Grisebach added a Cuban species, with some doubt accepted by Urban, Repert. Sp. Nov. 15: 109. Both Bentham and Hooker in *Genera plantarum* and Engler in *Pflanzenfamilien* have questioned the disposition of the genus in this family, from which Planchon in DC. Prodr. 17: 152 definitely excludes it. However, so far as I know, no one has yet placed it elsewhere, and Kuhlmann, Arch. Jard. Rio Janeiro, has described two Brazilian species which seem to establish it. It may not be Peruvian. The genus is placed in Ulmaceae on anatomical grounds by Priemer (?), Bot. Jahrb. 17: 466. 1893. The specimen he saw presumably was the original from the Lambert Herbarium, but no specimen has been found by me in Madrid material, Delessert Herb., or Berlin.

Ampelocera Ruizii Klotzsch, loc. cit.

Branches robust, squarrose, the branchlets slender, erect, evanescently pubescent; leaves short-petioled, oblong or obovate, attenuate at both ends, glabrous above, glabrate beneath, 5–9 cm. long, 2.5–3.5 cm. wide; stipules very thin, 2 mm. wide, 6 mm. long; racemes 2.5 cm. long, evanescently pubescent; perianth divisions obovate, dentate, persistent; style white-tomentose.

Without locality: (*Ruiz & Parón*).

48. MORACEAE. Mulberry Family

A family of great economic importance, especially in Central America, where one member, *Castilla*, is a source of rubber. In Peru several trees are, at least potentially, of value for their timber, notably the tupag or guariuba (*Clarisia*) with fine-grained, yellowish wood and the aita (several species of *Brosimum*), the wood white, on exposure reddish brown. Most of the trees exude a milky latex more or less elastic when dried, and discoloring. It has often some local use in medicine or otherwise.

At least two trees of the family are in cultivation: the mulberry (*Morus*) in the coastal valley, and occasionally the breadfruit, árbol de pan (*Artocarpus incisa*), as for example at La Merced.

The taxonomy of the family is in need of revision. Ducke, Archiv. Jard. Bot. Rio Jan. 4: 6–8. 1925, and in previous and subsequent volumes of the same publication, has given discriminating diagnoses and helpful observations on which I have freely drawn. In Arch. Inst. Biol. Veg. 2: 29. 1935, he indicates that he considers

as excessive the number of genera in the Olmedieae. In the following synopsis of Peruvian forms the present day grouping is followed for convenience but not in approval, for it results in wide separation of similar trees and is absurdly impractical, especially in an economically important family. To facilitate determination and especially to make clear the dovetailing of characters, the key for genera having completely staminate or completely pistillate receptacles is divided, one part being exclusively for staminate inflorescences, the other for the pistillate, much herbarium material showing only one sort. At the end of the general key is one keying all these genera as though they pertained to one group. See Field Mus. Bot. 11: 62–63. 1931, and remarks under some generic descriptions regarding possible relationships.

Low herbs.....1. *Dorstenia.*

Trees or shrubs.

Leaves palmately lobed or divided.

Leaves somewhat peltate; flowers spicate.....2. *Cecropia.*

Leaves not peltate; flowers cymose.....3. *Pourouma.*

Leaves entire, serrate, or lobed but not palmately.

Flowers on the inner surface of a hollow receptacle open only at the top of the receptacle, i.e., a fig.....5. *Ficus.*

Flowers not so disposed.

Flowers spicate or racemose, at least one sort.

Staminate flowers spicate, the spikes dense; pistillate capitate or, in *Trophis*, in short spikes.

Trees often spiny; leaves never much longer than 10 cm., often much shorter.

Filaments exserted; pistillate flowers capitate. 8. *Chlorophora.*

Filaments included or barely exserted; pistillate flowers spicate.....6. *Trophis.*

Trees unarmed, the leaves ample, often 20 cm. long or longer; pistillate flowers capitate.11. *Anonocarpus.*

Staminate and pistillate flowers in aments, or the latter rarely capitulate but few, or even solitary (*Clarisia*).

Staminate perianth present; leaves often somewhat toothed.

Filaments not inflexed; aments lax; pistillate perianth tubular or ovoid.....9. *Sorocea.*

Filaments in bud inflexed; aments dense, at least the pistillate, these fleshy in fruit.

Pistillate perianth tubular, accrescent; staminate segments valvate; leaves usually entire.
6. *Trophis.*

Pistillate perianth segments distinct, the staminate imbricate; fruit juicy; leaves serrate..7. *Morus.*

Staminate perianth absent; leaves strictly entire.
10. *Clarisia.*

Flowers not in aments (cf. also *Clarisia,* sometimes, and *Chlorophora* as to pistillate flowers).

Petioles mostly under 1 cm. long or if some to about 1.5 cm., these in the minority; ovules pendulous.

Receptacles head-like, composed of many stamens and 1–4 pistils, these deeply inserted.

Stamens exserted, crowded at throat of the receptacle about the exserted style.....20. *Trymatococcus.*

Stamens separated in all the receptacles by peltate bracts.....12. *Brosimum.*

Receptacles often capitate but completely staminate or pistillate.

Pistillate receptacles (see below for key to staminate).

Receptacle 1-flowered; styles filiform (cf. *Olmedioperebea* under *Pseudolmedia*).

Ovary inferior, fixed to the perianth.
17. *Pseudolmedia.*

Ovary superior, free in the perianth..18. *Olmedia.*

Receptacle many-flowered; styles thick to filiform (cf. *Olmedioperebea*).

Styles thick, short, the stigma compressed or capitate-cushion-like.

Perianth truncate, compressed, in aggregate forming an Anona-like fruit.
11. *Anonocarpus.*

Perianth 4-toothed, the fruit fleshy, but scarcely Anona-like (here also *Olmedioperebea*).
14. *Perebea.*

Styles or at least stigmas slender or filiform.

Perianth lacking; bracteoles peltate (probably in Peru).....*Brosimopsis.*

Perianth present, sometimes pseudobracteolate.

Perianth segments divided to the base, the parts thus bracteole- or scale-like in the receptacle.....13. *Ogcodeia.*

Perianth merely lobed or parted.

Perianth segments imbricate; receptacles and young parts of plant reddish-tomentose.....19. *Helicostylis.*

Perianth segments various; pubescence, if present, not characteristically reddish-tomentose.

Perianth 4-lobed, the lobes not perforated; bracts all small..15. *Castilla.*

Perianth segments perforated; inner bracts elongate.....16. *Noyera.*

Staminate receptacles.

Perianth absent but the bracteoles may form a pseudoperianth.

Bracts seriate, the inner not elongate; leaves hirsute above or beneath.....15. *Castilla.*

Bracts toward the interior often longer than the outer; leaves often smooth or, if hirsutulous, only sparsely.

Bracteoles obvious, spatulate or peltate. 17. *Pseudolmedia.*

Bracteoles (or divided perianths) scalelike; see *Naucleopsis* mentioned under 13. *Ogcodeia.*

Perianth present (deeply parted perianths may simulate bracteoles).

Stamens interspersed with peltate bracteoles. *Brosimopsis.*

Stamens and bracteoles not so intermixed, the latter, if not wanting, not peltate.

Bracts all small, the interior little longer than the outer.

Plant pubescence reddish brown. 19. *Helicostylis.*

Plant pubescence, if present, not at all or not very reddish.

Leaves usually scabrous above.

17. *Olmedia.*

Leaves not scabrous above..14. *Perebea.*

Bracts unequal, the interior longer than the outer, closely seriate.

Leaves glabrous or nearly so; receptacles shortly pediceled or sessile..13. *Ogcodeia.*

Leaves harshly hirsute above; receptacles long-pediceled.....15. *Noyera.*

Petioles mostly 2 cm. long or longer; ovule erect.

Flowers cymose or the staminate capitulate and cymose; stamens 3–4; stigma peltate.....3. *Pourouma.*

Flowers globose-capitate, the heads single or cymose; stamens 1–2; stigma penicillate.....4. *Coussapoa.*

Aggregate Key to the Species of Genera 13–19, *Inclusive*

Leaves scabrous-puberulent, at least on one side.

Leaves scabrous on both sides.

Leaves entire; staminate peduncles 5–7 mm. long.

17. *Pseudolmedia scabra.*

Leaves generally undulate-serrate; staminate receptacles sessile or subsessile.....18. *Olmedia aspera.*

Leaves scabrous only beneath.

Leaves undulate-serrate; staminate receptacle sessile or subsessile.....18. *Olmedia Poeppigiana.*

Leaves entire; staminate peduncles to 6 mm. long.

14. *Perebea Chimiqua.*

Leaves glabrous to variously pubescent but not scabrous only.

Leaves strictly glabrous.

Leaves mostly or all narrower than 3 cm.

Leaves caudately acuminate; ovary superior.

18. *Olmedia angustifolia.*

Leaves obtusely acuminate; ovary inferior.

17. *Pseudolmedia laevigata.*

Leaves mostly or all 3.5–6 cm. wide or wider.

Branchlets spreading-hirsute.....17. *Pseudolmedia laevis.*

Branchlets glabrous or puberulent.

Petioles to 3 mm. long; leaves somewhat acuminate.
17. *Pseudolmedia Mildbraedii.*

Petioles mostly or all much longer; leaves caudate.

Leaves rarely 6.5 cm. wide, the lateral nerves 15–20.

Petioles rarely 1 cm. long; nerves beneath rather inconspicuous.

Leaves 3–4 cm. wide, cuneate at the base.
13. *Ogcodeia ternstroemiiflora.*

Leaves 5–6 cm. wide, rounded at the base.
13. *Ogcodeia Tamamuri.*

Petioles often longer; nerves beneath conspicuous.

Leaves rarely 5 cm. wide, the acumen often 2 cm. long.....13. *Ogcodeia Tessmannii.*

Leaves often 6–7 cm. wide, the acumen rarely 1.5 cm. long.....13. *Ogcodeia glabra.*

Leaves mostly 8–12 cm. wide, the lateral nerves 25–30.
13. *Ogcodeia Ulei.*

Leaves more or less pubescent, at least on the nerves beneath.

Pubescence, at least on the midnerve beneath, setulose or hirsute.

Leaves acute at base or, if subcordate, not at all pseudopeltate.

Petioles 2–5 mm. long.

Leaves strongly pubescent on both sides; interior bracts of both sorts of receptacles elongate.
16. *Noyera mollis.*

Leaves glabrous (except *Castilla*) or finally glabrate above; interior bracts little or not at all longer than the outer.

Leaves, unless in age, harshly pubescent above; pistillate receptacles several-flowered..15. *Castilla Ulei.*

Leaves glabrous or glabrate above; pistillate receptacle 1-flowered.

Pubescence of plant appressed.
17. *Pseudolmedia macrophylla.*

Pubescence of plant hirtellous, sparse.
17. *Pseudolmedia laevis.*

Petioles 8–12 mm. long.

Leaves gradually acuminate, 3–5 cm. wide; staminate perianth lacking.....17. *Pseudolmedia multinervis.*

Leaves subcaudate-acuminate, 10–20 cm. wide.

Leaves not oblique at base; stigmas cushion-like. 14. *Perebea australis.*

Leaves oblique at base; stigmas lingulate. 14. *Perebea Tessmannii.*

Leaves appearing peltate at the subcordate base. 14. *Perebea pseudopeltata.*

Pubescence merely a puberulence, or a reddish tomentum.

Pubescence not a reddish tomentum.

Petioles 2–5 mm. long; staminate receptacle yellowish-pubescent, a perianth present. 17. *Pseudolmedia macrophylla.*

Petioles 5–7 mm. long, the receptacles not so pubescent.

Leaves about 5 cm. wide.....14. *Perebea elegans.*

Leaves about twice as wide.....14. *Perebea Standleyi.*

Pubescence a reddish tomentum...19. *Helicostylis tomentosa.*

1. DORSTENIA L.

Stemless or subprostrate herbs from thick, tuber-like rootstocks. Receptacles large, rounded or lobed, on long or short peduncles.

Plants stemless; receptacles 4-sided.

Peduncles and petioles elongate, subequal.....*D. Contrajerva.*

Peduncles shorter than the short petioles.....*D. tubicina.*

Plants caulescent, subprostrate; receptacles orbicular..*D. umbricola.*

Dorstenia Contrajerva L. Sp. Pl. 121. 1753.

Leaves varying from entire to deeply lobed, ovate to suborbicular, glabrous to pubescent, often 10 cm. long; petioles often nearly as long or longer; receptacles green, entire or lobed, borne on slender, erect peduncles usually 10–30 cm. long.—Known as "contrahierba" in Central America, where in some places the thick rootstocks are used to flavor cigarettes (Standley). Illustrated, Bailey, Cycl. Hort. 1067.

San Martín: Tarapoto, *Ule 6509; Williams 5905.* Rumizapa, *Williams 6832.* Extending to Mexico and the West Indies.

Dorstenia tubicina R. & P. Fl. 1: 65. *pl. 102*. 1798.

Leaves cordate-ovate or cordate-oblong, doubly serrate, rough above, soft-pubescent beneath; receptacles violet in flower, white in fruit, recurving on peduncles shorter than the short petioles.—The fragrant roots are used as "contrahierba." Illustrated, Bot. Mag. *pl. 2804*, from specimens presumably from Trinidad. Neg. 11614.

Huánuco: Chinchao and environs, *Ruiz*. Argentina. "Carpales."

Dorstenia umbricola A. C. Smith, Bull. Torrey Club 58: 87. 1931.

Leaves green, oblong-lanceolate or obovate-lanceolate, cuneate or truncate at the base, acute, entire or undulate-crenate, glabrous above, sparsely pilose on the nerves beneath, 8–10 cm. long, on slender petioles 5–13 mm. long; peduncles at maturity 2.2 cm. long; receptacles (mature) 1.5 cm. broad, the staminate and pistillate flowers separated.—Perhaps a variety of *D. argentata* Hook. f., with variegated leaves and fleshier receptacles, more definitely tuberculate marginally.

Loreto: Soledad on Río Itaya, *Killip & Smith 29639*, type.

2. CECROPIA L.

Beautiful and common trees of the montaña, immediately recognizable by their smooth, light-colored trunks and branches supporting open crowns that bear abundantly large or even huge, long-stalked, palmately divided leaves that are usually dark green above and silvery or gray-tomentose beneath. Ruiz and Pavón observed that the handsome leaves follow the course of the sun, the position of the upper surface at night becoming partly reversed. Parts, at least, of the hollow trunks and branches appear to be regularly inhabited by black ants that rush out almost instantly upon the slightest disturbance in countless hordes to defend their home. Ruiz and Pavón noted, however, that sometimes the hollow, articulated branches or trunks are filled with clear, perfectly tasteless sap which the Indians, when other water lacked, drank to quench their thirst. The trunks are said to be used for tibias or trumpets in the Amazon region, and the fiber of the bark has been employed in making mats and coarse cloth. The usual common name for the tree in Peru seems to be "tacuna," written also "tacuma" and "tacona," or "setico," but Spruce found "imbauba" used on the Amazon, and Wallace, who observed the Indians using the leaves as a head-dress, recorded the

term as "umbooba." Weberbauer, 275, gives a good photograph of slender *Cecropia* trees. It may be helpful to call attention to *Pourouma cecropiaefolia*, which in foliage alone simulates *Cecropia*.

Leaves with many, usually 12–16, lobes or leaflets.

Leaflets distinctly petioled or entirely separate, paler but not white-pubescent beneath.....*C. sciadophylla.*

Leaflets more or less joined (or the leaves merely lobed), at least at the very base, and white- or grayish-pubescent beneath, at least between the veins.

Leaves white-tomentose, pilose, or sericeous-pubescent above, not scabrous or not scabrous only.

Leaves typically 10–11-lobed, greenish above.

Leaves divided nearly to the base; staminate spikes many. *C. leucophaea.*

Leaves often only three-fourths divided; staminate spikes about 4.....*C. acutifolia.*

Leaves typically 12–13-lobed, white-tomentose above. *C. albicans.*

Leaves scabrous above.

Leaves white- or grayish-tomentose beneath.

Leaves typically 11–16-lobed.....*C. angustifolia.*

Leaves typically 10-lobed.

Petioles and leaf nerves hirtellous beneath....*C. strigosa.*

Petioles and leaf nerves tomentulose beneath. *C. montana.*

Leaves reddish-hirsutulous, somewhat white-pubescent beneath.....*C. tubulosa.*

Leaves with 5–11 lobes, rarely parted to the base.

Leaf lobes entire or merely undulate-repand.

Leaves more or less pubescent above, usually scabrous.

Lobes of the leaves typically 10 or 11.

Leaves softly pubescent above, the scabrosity, if any, obscured.

Leaves parted almost to the base.....*C. leucophaea.*

Leaves merely deeply lobed.....*C. acutifolia.*

Leaves scabrous-pubescent above, other pubescence not marked.

Petioles and leaves beneath more or less hirtellous.

Leaves shallowly lobed.....*C. strigosa.*

Leaves very deeply lobed.....*C. tubulosa.*

Petioles and leaves beneath merely white-lanuginose. *C. montana.*

Lobes of the leaves typically 8 or 9, or fewer.

Leaf lobes typically 8 or 9.

Leaves corrugated-rugose above.

Leaves concolorous beneath, the nerves villous. *C. nivea.*

Leaves with nerves and veins beneath green or brown. *C. Klotzschiana.*

Leaves not all or not definitely rugose above.

Leaf nerves many (20–25) and mostly 1 cm. or less apart.

Staminate spikes many; leaves shallowly lobed. *C. latiloba.*

Staminate spikes few; leaves deeply lobed.

Leaves somewhat floccose or more floccose than scabrous above.....*C. leucocoma.*

Leaves obviously scabrous above.....*C. bicolor.*

Leaf nerves 12–15 and mostly more than 1 cm. apart.

Staminate spikes many (–50); leaves asperous above. *C. multiflora.*

Staminate spikes few (–20); leaves often floccose above.

Leaves hirtellous on the nerves beneath..*C. bicolor.*

Leaves tomentose even on the nerves beneath. *C. obtusa.*

Leaf lobes typically 5, 6, or 7.

Lobes of the leaves broadly obovate, 10–20 cm. wide.

Petioles, leaf nerves beneath, and peduncles loosely pilose or hirsutulous.

Leaves asperous above, the lobes obtuse or acute. *C. ficifolia.*

Leaves hirsutulous above, the lobes acuminate. *C. Standleyi.*

Petioles, leaf nerves beneath, and, usually, peduncles tomentose.....*C. obtusa.*

Lobes of the leaves oblongish, scarcely at all obovate, less than 10 cm. wide.....*C. Engleriana.*

Leaves glabrous above.

Leaves pubescent beneath.

Petioles white-tomentose; pistillate spikes 6–10 cm. long. *C. Francisci.*

Petioles tomentose with soft, white, and setulose, often brown hairs mixed; pistillate spikes twice as long. *C. flagellifera.*

Leaves glabrous beneath (the nerves mostly minutely puberulent).

Leaves very deeply lobed; staminate spikes few, very woolly, elongate.....*C. Setico.*

Leaves moderately (to three-fourths) lobed; staminate spikes very many.....*C. Tessmannii.*

Leaf lobes, or some of them, dentate, repandly toothed, or pinnatifid.

Leaf divisions dentate-serrate.....*C. dentata.*

Leaf divisions more or less pinnately lobed.....*C. polystachya.*

Cecropia acutifolia Trécul, Ann. Sci. Nat. III. 8: 81. 1847.

A tree with 10–11-lobed leaves, the lobes with rotund sinuses, elongate and acutely subacuminate, the largest 5–7 cm. wide and about 20 cm. long; pubescence of the branchlets and leaves beneath early white-tomentose, later pilose on the former and the nerves; petioles white-tomentose; staminate peduncles 5–7 cm. long; bracts acuminate, 11 cm. long; spikes 4, on pedicels 5–10 mm. long; pistillate spikes 6, nearly 20 cm. long, 8 mm. thick, the fruit verruculose, oblong-conic, acute.

Peru: (*Pavón*).

Cecropia albicans Trécul, Ann. Sci. Nat. III. 8: 82. 1847.

Leaves plane, divided halfway to the base, the lobes obtuse or obtusely acuminate, white-hirtellous beneath between the very slender, reticulate, rufescent veins; petioles 35 cm. long, white with a short, dense pubescence; stipules 16 cm. long and 12 cm. broad; pistillate peduncle thick, 1.5–2 cm. long; bract 5 cm. long, abruptly attenuate; spikes 3–4.—Here seems to belong material at Madrid, without locality, by Ruiz and Pavón; the staminate spikes are many.

Peru: *Pavón.*

Cecropia angustifolia Trécul, Ann. Sci. Nat. III. 8: 83. 1847. *C. digitata* Klotzsch, Linnaea 20: 534. 1847.

A tall, handsome tree with pale bark and spreading crown; leaves ample, dark green and scabrous above, deeply lobed, the lobes oblong-ligulate, the larger about 5 cm. wide and 3–4 times as long; petioles 30–40 cm. long; staminate spikes many, the pistillate 2–4, about 4 cm. long; fruit oblong, acute. Neg. 11581.

Junín: La Merced, 1,200 meters, *5741*. Above San Ramón, 1,700 meters, *Killip & Smith 24737;* a tree of 9–12 meters.—Huánuco: *Ruiz & Pavón.*—Puno: Sangabán, *Lechler*(?).

Cecropia bicolor Klotzsch, Linnaea 20: 531. 1847.

Leaves with elongate-oblong, shortly acuminate lobes, green but scabrous above, white-tomentose beneath except for the green, hirsutulous nerves; pistillate peduncle long-villous, about 7 cm. long, bearing 4 spikes 15 to nearly 20 cm. long.—The greatly elongate spikes are striking. The species may be allied to *C. flagellifera.* Neg. 11582.

Huánuco: Muña, *Ruiz.*

Cecropia dentata Klotzsch, Linnaea 20: 533. 1847.

Very imperfectly known; leaf lobes 9, short, obovate, acute, the margins dentate-subserrate, green but hirsute-scabrous above, white-tomentose beneath except for the muricate-hirsute midrib and nerves; petiole 15–20 cm. long, sparsely pilose.

Huánuco: Muña, (*Ruiz & Pavón*).

Cecropia Engleriana Snethl. Notizbl. Bot. Gart. Berlin 8: 365. 1923.

Allied to *C. ficifolia* but the pubescence of the lower leaf surface entirely lanuginose, the stipules, petioles, and leaves often smaller, and the latter deeply 7-lobed, the lobes oblongish, 5–7 cm. wide and with 22–25 lateral nerves; staminate spikes very slender. Neg. 11586.

Río Acre: *Ule 9313.*

Cecropia ficifolia Warb. ex Snethl. Notizbl. Bot. Gart. Berlin 8: 365. 1923.

A small to tall (30 meters) tree with ample, peltate leaves, greenish but densely asperous-pubescent above and white-tomentose beneath, not at all deeply 5–6-lobed, the rotund-obovate lobes (to 45 cm. long

and 20 cm. wide) obtuse or acute, remote and little narrowed below; lateral nerves 12–16; petioles 30–45 cm. long; stipules to 15 cm. long, pubescent also within; staminate peduncle about 7 cm. long, the pistillate twice as long; staminate spikes 12 or more, 5–7 cm. long, 2–3 mm. thick, the pedicels 1.5–2 cm. long; enveloping hairs 0.5–1 mm. long; filaments unequal; pistillate spikes 4–6, sessile, 8 cm. long, about twice as long in fruit and 8 mm. thick, lightly tomentose; stigmas penicillate; fruit 2–3 mm. long, faintly verruculose. Neg. 11587.

Río Acre: *Ule 9311; Huber 4245.*

Cecropia flagellifera Trécul, Ann. Sci. Nat. III. 8: 81. 1847. *C. Ruiziana* Klotzsch, Linnaea 20: 532. 1847.

Apparently very similar to *C. Francisci*, but with shorter petioles, smaller leaves, and fewer (4) pistillate spikes, these in fruit 20 cm. long and 8–9 mm. thick.

Peru: (*Pavón*).

Cecropia Francisci Snethl. Notizbl. Bot. Gart. Berlin 8: 369. 1923.

A tree as much as 25 meters high, with punctate-asperous branchlets, long-pubescent stipules to 20 cm. long, petioles nearly 40 cm. long, and coriaceous leaves about 9-lobed to the middle, the largest of the broadly obovate lobes 40 cm. long and 20 cm. broad; peduncles 10 cm. long or longer; pistillate spikes 5–6, sessile, 7–8.5 cm. long, 4–5 mm. thick, before flowering densely tomentose; stigma penicillate.—*C. palmata* Willd. has leaf nerves reddish beneath, finely and minutely pubescent or puberulent rather than tomentose-hirtellous. Neg. 11588.

Río Acre: *Ule 9312.*

Cecropia Klotzschiana Miq. in Mart. Fl. Bras. 4, pt. 1: 151. 1853. *C. scabra* Ruiz ex Klotzsch, Linnaea 20: 531. 1847, non Mart. 1831.

Apparently too near *C. nivea*, but the pubescence beneath between the veins felt-like, the peduncles sparsely hispid, and the pedicels hirtellous. Neg. 11591.

Peru: *Ruiz.*

Cecropia latiloba Miq. in Mart. Fl. Bras. 4, pt. 1: 147. 1853.

Branchlets glabrate; leaves rather similar to those of *C. obtusa* but with many (about 25) lateral nerves 0.5–1 cm. apart; staminate

spikes 25–30, about 8 cm. long, the pedicels 5 mm. long, hirsute; pistillate spikes sessile, finally 15 cm. long; fruits 3 mm. long, tomentose at the tip. Neg. 18838.

Loreto: Yarina-cocha, *Tessmann 3467, 3466* (det. Snethlage). Río Masana, *Williams 96*. Lower Ucayali, *Tessmann 3307* (var.; det. Snethlage). Cumaría, *Tessmann 3253* (det. Snethlage). Brazil; Bolivia.

Cecropia leucocoma Miq. in Mart. Fl. Bras. 4, pt. 1: 142. 1853.

Petioles, peduncles, and young leaves above greenish but lightly and loosely lanuginose; leaves thin, deeply (even to the base) divided, the elongate-obovate lobes apiculate or rounded, white-tomentose beneath or merely araneose; lateral nerves about 1 cm. apart or less, usually about 20; staminate spikes fewer than 12, about 7 cm. long, the pedicels to 5 mm. long; pistillate spikes about 4, to 15 cm. long, 5–8 mm. thick, subsessile, the slender peduncle 6–8 mm. long.—*Tessmann 4058* has been given a subspecific herbarium name by Snethlage, but it has the close, parallel nerves of *C. leucocoma* and could be treated as a variety of the latter with longer, thicker (20 cm. long, 9 mm. thick), distinctly pediceled pistillate spikes or, more probably, as a distinct species. *C. adenopus* Mart. and *C. scabra* might be sought here. The former may be known by its hispidulous petioles and peduncles; the latter by its reduced (asperous and hirtellous) leaf pubescence and its merely ternate staminate spikes. Neg. 11592. Illustrated, Wawra, Bot. Ergebn. Reise Bras. *pl. 85*.

Loreto: Middle Ucayali, *Tessmann 3306, 3455* (one a glabrate form, det. Snethlage). Yurimaguas, 200 meters, *Williams 4173*. Bolivia; Brazil. "Setico," "siari chal."

Cecropia leucophaea Poepp. ex Miq. in Mart. Fl. Bras. 4, pt. 1: 151. *pl. 50*. 1853.

Probably allied to *C. multiflora*, but the more numerous acute leaf lobes not more scabrous above than otherwise pubescent; nerves beneath green but hirsute-villous; staminate spikes very numerous, 5–7.5 cm. long, on hirsute pedicels 4 mm. long.

Huánuco: Cochero, *Poeppig*.

Cecropia montana Warb. ex Snethl. Notizbl. Bot. Gart. Berlin 8: 368. 1923.

A small tree (to 10 meters) with short, white-pilose branchlets, rather small stipules (about 5 cm. long) glabrate within, petioles 35 cm. long, and deeply 10-lobed leaves white-tomentose beneath, the

lobes oblong, the largest 30 cm. long and a little less than a third as wide; lateral nerves 15–25; peduncle 2.5–4 cm. long; pistillate spikes 4, becoming 3.5–6 cm. long and 6–10 mm. thick; fruit oblong, 2 mm. long, minutely tubercled. Neg. 11599.

Loreto: Cerro de Escalera, 1,300 meters, *Ule 6845*.

Cecropia multiflora Snethl. Notizbl. Bot. Gart. Berlin 8: 367. 1923.

A small tree (10 meters, so far as known) with minutely pilose branchlets and rather deeply lobed leaves, the largest obovate, acutish lobes about 30 cm. long and scarcely half as broad, the pubescence above merely asperous, beneath white-tomentose, the midrib and 12–14 nerves minutely pilose; peduncle 5–8 cm. long, finely pilose; staminate spikes as many as 50 and 10–15 cm. long, 2–3 mm. thick, on pedicels 1–2 cm. long; perianth 1–1.5 mm. long, minutely pubescent; filaments nearly equal, the anthers before anthesis ecaudate.—Similar to *C. nivea* and *C. Klotzschiana*, but from herbarium material distinguishable by the even upper leaf surfaces. Neg. 11600.

Junín: Chanchamayo Valley, 800 meters, *Weberbauer 1837*, type.

Cecropia nivea Poepp. ex Klotzsch, Linnaea 20: 532. 1847.

Leaves large, deeply 9-parted, the acute, obovate lobes green but scabrous-hispid above, loosely and densely white-tomentose beneath; staminate peduncle 3.5–5 cm. long, densely hispid-villous, bearing many slender spikes 7 cm. long, their subulate pedicels 6 mm. long.—Suggests *C. multiflora*, but the leaves are noticeably rugose. Neg. 11601.

Peru: *Poeppig*.

Cecropia obtusa Trécul, Ann. Sci. Nat. III. 8: 79. 1847.

Branchlets strigose; leaf lobes obovate-rotund, very obtuse, tomentulose above at first, finally asperous, often 20 cm. long and half as broad or larger, the lateral nerves 1–2 cm. apart, about 15; staminate peduncle about 20 cm. long, bearing 12–15 shortly pediceled spikes only 4–5 cm. long; perianth tubular, subentire, minutely hirtellous; pistillate spikes 8–9 cm. long, 1 cm. thick, on pedicels 2–4 mm. long; fruit obovate, verruculose, white-tomentose-punctate.—*C. palmata* Willd. has leaves glabrate above and pistillate spikes 13–15 cm. long. Neg. 25536.

Loreto: La Victoria, *Williams 2557*. Caballo-cocha, *Williams 2068*.—Without locality: (*Pavón*). Brazil; British Guiana. "Setico."

Cecropia polystachya Trécul, Ann. Sci. Nat. III. 8: 80. 1847. *C. pinnatiloba* Klotzsch, Linnaea 20: 533. 1847.

Well marked (if the character is constant) by the lobed middle leaflets; lobes 9–10, ovate, glabrous above, pubescent beneath, the larger 7.5 cm. broad, about 20 cm. long; staminate peduncle tomentose, 7.5 cm. long, the 20 pediceled spikes 5–10 cm. long; pistillate spikes about 4 and 6 cm. long, the peduncle a little longer. Neg. 25538.

Huánuco: Muña, *Ruiz.*

Cecropia sciadophylla Mart. Flora 24, pt. 2: Beibl. 93. 1841.

Immediately recognizable by its petioled or entirely disjoined leaflets that are glabrous or merely puberulent-tomentulose in the areoles, even beneath.—Snethlage has distinguished var. *decurrens* Snethl. and var. *Juranyiana* (A. Richt.) Snethl., the latter the extreme variation with the leaflets actually sessile. This is a medium to tall tree with huge leaves (the largest leaflets about 50 cm. long and nearly 10 cm. wide or wider), glabrate petioles several dm. long, 4–6 pistillate spikes about 10 cm. long, and several staminate spikes, the filaments somewhat unequal. Illustrated, Mart. Fl. Bras. 4, pt. 1: *pl. 46.*

Loreto: Lower Río Napo, *Tessmann 3718* (det. Snethlage). Mouth of Río Santiago, *Tessmann 4717, 4278* (det. Snethlage). Caballo-cocha, in forest, *Williams 2130.* Brazil. "Setico."

Cecropia Setico Snethl. in herb., sp. nov.

Folia inter maxima, ad 60 cm. lata et ultra, subtus ad nervos fere microscopice pulverulenta; pedunculi leviter spinuloso-ciliati vel glabrati ad 10 cm. longi; spicae 4 dense lanatae fere sessiles in statu fructifero circa 20 cm. longae.

Leaves very large, at least 60 cm. wide, almost microscopically pulverulent on the nerves beneath; peduncles lightly spinulose-ciliate or glabrate, to about 10 cm. long; spikes 4, very woolly, becoming about 20 cm. long, nearly sessile. Neg. 11608.

Loreto: Unanana, Lower Río Napo, 100 meters, *Tessmann 3713.* "Setico."

Cecropia Standleyi Macbr. Field Mus. Bot. 11: 61. 1931.

A small, slender tree of 3–6 meters, similar to *C. ficifolia* but easily distinguishable by the soft, scattered trichomes of the upper leaf surfaces and the short-acuminate, broadly obovate leaf lobes;

pubescence beneath not at all lanuginose; staminate aments 8–10, 9 cm. long, 3 mm. thick, the pedicels 1 cm. long, the filaments equal; pistillate spikes 4, subsessile, 18 cm. long, 1 cm. thick, lightly tomentose.

Loreto: Mishuyacu near Iquitos, 100 meters, *Klug 399*, type. Iquitos, 100 meters, *Killip & Smith 27033*. "Setico."

Cecropia strigosa Trécul, Ann. Sci. Nat. III. 8: 82. 1847.

Similar to *C. angustifolia*, but the leaf lobes fewer and the pubescence more hirtellous, in this respect approaching *C. tubulosa;* staminate spikes about 60; pistillate spikes about 7.

Peru: (*Pavón*).

Cecropia Tessmannii Mildbr. Notizbl. Bot. Gart. Berlin 9: 260. 1925.

Leaves large, glabrous, deeply (three-fourths their length) 9-lobed; spikes similar to those of *C. multiflora* but not distinctly pediceled; filaments very short.—Fruit edible. *C. laetevirens* Huber, Bol. Mus. Goeldi 6: 63. 1910, and *C. bifurcata* Huber, op. cit. 62, would be sought here. The leaves of both are broadly and obtusely lobed, more or less fulvous-pilose beneath but green and glabrous to the eye. *Williams 4313* (part of a leaf) from Yurimaguas is perhaps *C. Tessmannii*. Neg. 11609.

Loreto: Yarina-cocha, 150 meters, *Tessmann 3454*. Fortaleza, in forest, 200 meters, *Williams 4313*. Santa Rosa, 200 meters, *Williams 4949*. "Setico," "pungara."

Cecropia tubulosa Ruiz ex Klotzsch, Linnaea 20: 534. 1847.

Probably only a form or possibly a variety of *C. angustifolia*, but the leaves beneath more conspicuously reddish-hirsutulous than white-tomentulose. *C. angustifolia* may be rubescent on the nerves. Neg. 11610.

Huánuco: Chinchao, Muña, *Ruiz & Pavón*.

3. POUROUMA Aubl.

Trees with entire or 3–5-lobed leaves, or one species with 8–12-parted leaves simulating those of *Cecropia*, but the inflorescence always cymose and the rather large, often densely velvety-tomentose fruits borne distinctly.—See Mart. Fl. Bras. 4, pt. 1: 123–132, for a number of Amazonian species to be expected, particularly several with entire leaves. Other extra-Peruvian species published more

recently, and possibly occurring, are mentioned below. Spruce found the name "cocura" used for an Amazonian species.

Leaves not parted or deeply lobed.

Pubescence fulvous or brown.....*P. phaeotricha.*

Pubescence white or gray.....*P. folleata.*

Leaves palmately parted or lobed, at least typically and some of them.

Leaves 8 (6)–12-parted.....*P. cecropiaefolia.*

Leaves 3–5-lobed.

Leaves deeply cordate at base, harshly hairy on both sides.
P. substrigosa.

Leaves little if at all cordate, or not pubescent.

Leaves not distinctly, if at all, cordate.

Branchlets glabrous or puberulent, the leaves white-hairy beneath.

Petioles glabrous or early granulose.....*P. Tessmannii.*

Petioles tomentose, glabrate only in age...*P. Jussieuana.*

Branchlets yellowish-hairy, like the leaves beneath.

Leaves strigose or scabrous above.....*P. palmata.*

Leaves glabrous above.....*P. triloba.*

Leaves deeply cordate at the base..... .....*P. Ulei.*

Pourouma cecropiaefolia Mart. ex Miq. in Mart. Fl. Bras. 4, pt. 1: 123. *pl. 36.* 1853. *P. multifida* Trécul, Ann. Sci. Nat. III. 8: 107. 1847(?).

The only Peruvian species with Cecropia-like leaves that are cordate-rotund and radiately parted; segments obovate-oblong-lanceolate, velvety and ashy- or white-tomentose beneath, the largest middle ones sometimes 15–30 cm. long and 10–20 cm. broad, all more or less connate toward the base; petioles glabrous; peduncles puberulent; inflorescence in flower dense, reddish purple with a close puberulence, the fasciculate or capitulate staminate flowers sessile or nearly so, their minutely setulose segments entirely free.—According to Martius, a tree of 10–15 meters with the habit of a *Cecropia* but with juicy fruits that have a pleasant, sweetish-sour taste. Sometimes cultivated. The Martius name (Reise 3: 1130. 1831) is essentially a nomen nudum until taken up by Miquel. There is no doubt, however, as to its application, and Martius gave the common names and described the fruit. Lacking positive proof that *P. multi-*

fida Trécul is the same, I retain the well-known name. A specimen by Killip and Smith (*27932*) from Puerto Arturo, Loreto, has been determined in Herb. Berlin by Mildbraed as *P. sapida* Karst. It is not clear to me that the latter species is distinct. Its leaves have 9 lobes. In the Field Museum specimen they are separate nearly to the base.

Loreto: Above Pongo de Manseriche, 200 meters, in forest, *Mexia 6257*. Mishuyacu, 100 meters, in clearing, *Klug 1185, 1326*. Mouth of Río Blanco, *Tessmann 3054*. Alto Río Itaya, *Williams 3347*. Iquitos, *Ducke 7581; Killip & Smith 27381, 29839* (both det. by A. C. Smith).—Huánuco: Huamalíes District, *Weberbauer 3705*. —Río Acre: *Ule 9314*.—Junín: La Merced, 600 meters, *5446*. Brazil. "Ambauba mansa," "ambauba do vinho," "mapaty," "cucura," "uvilla."

Pourouma folleata Macbr. Field Mus. Bot. 8: 114. 1930.

Branchlets glabrous; petioles evanescently appressed-setulose, 2–3 cm. long; leaves entire or repand-undulate, elliptic, acute at the base, very shortly acuminate, the larger 12 cm. long, 6 cm. wide, glabrous above or the midnerve strigillose, shortly white-tomentulose beneath between the 15 nerves, these densely strigillose; stipules yellowish-villous, 2.5 cm. long; peduncles 1.5 cm. long; compound cymes grayish-brown-hirsutulous, open, the slender-pediceled staminate flowers not at all capitulate; segments linear-subulate, acuminate.—*P. apiculata* Spruce and *P. tomentosa* Mart. have entire leaves arachnoid-tomentose beneath, the former distinguished from the latter by the apiculate leaf acumination. Its large fruits are velvety. *P. crassivenosa* Mildbr. Notizbl. Bot. Gart. Berlin 10: 419. 1928, is glabrous beneath to the eye except on the nerves. *P. paraensis* Huber is hirtellous on the veins beneath, appressed-lanate in the areoles.

Junín: La Merced, 1,300–1,700 meters, *Schunke 416, A95*.

Pourouma Jussieuana Trécul, Ann. Sci. Nat. III. 8: 106. 1847.

A tree with angled, verruculose, finally glabrous branchlets and palmately 3–5-lobed, not at all cordate leaves; leaf lobes glabrous above, oblong or the middle ovate, repand, acuminate, the larger 12 cm. wide and 15–25 cm. long, with 17–22 nerves, these conspicuous beneath; petioles pubescent, 5–6 cm. long; pistillate inflorescence cymose-paniculate, the puberulent peduncle 5 cm. long; fruit ovate, densely pale-rusty-puberulent; seed depressed-ovate.—*P. cuspidata*

Warb. of Amazonian Brazil is recognizable by the scabrosity of its leaves beneath and its small staminate flowers, less than 1 mm. long, the branchlets of the inflorescence thick.

Peru: Buena Vista (*Jussieu*). "Amandier de Buena-Vista."

Pourouma palmata Poepp. & Endl. Nov. Gen. & Sp. 2: 29. *pl. 141*. 1838.

Young branchlets densely yellow-scabrous; leaves rounded or subcordate, with 3–5 oblong or ovate, acute lobes, harshly scabrous above but silky-pubescent beneath, especially on the prominent nerves (the lateral about 30); petioles subterete, the upper 8 cm. long, shortly pubescent; staminate flowers glomerate, the inflorescence much branched; perianth segments shortly united, oblong, hirsutulous at the apex, equaled by the dense filaments; immature fruiting inflorescence velvety in appearance, with a dense, reddish brown pubescence; pedicels thick, 3–5 cm. long; young fruits ovate, conspicuously capped by the peltate stigma.—Fruits edible. Neg. 11622.

San Martín: Tocache, *Poeppig 2881, Addenda 153*.—Huánuco: Huamalíes, *Weberbauer 3639*.—Loreto: Pampa del Sacramento (*Huber*). "Uvilla."

Pourouma phaeotricha Mildbr. Notizbl. Bot. Gart. Berlin 10: 193. 1927.

Young branches, petioles, and inflorescence rusty puberulent-tomentose, with paler, rigid hairs intermixed; leaves very regularly oblong-elliptic, obtuse at the base, very acutely acuminate, often to 20 cm. long and 8–9 cm. broad, the mature ones glabrate above, beneath on the midrib and 8–10 lateral nerves more or less hirsutulous and rusty puberulent-tomentose, the areoles ashy green and under a lens white-araneose; fruiting inflorescence with few short branchlets, the pedicels 5–8 mm. long; stigma greenish white, pulvinate, densely brown-tomentose and white-hirsute; immature fruit 12 mm. long, 8–9 mm. thick, bright green.—A tree of 7 meters, the trunk 8 cm. in diameter, with few branches 2 meters above the base. *P. aurea* Mildbr. op. cit. 10: 418, has obovate-oblong leaves broadest at the upper third, with 15–17 lateral nerves. Neg. 11624.

Loreto: Iquitos, *Tessmann 5364*.

Pourouma substrigosa Mildbr. Notizbl. Bot. Gart. Berlin 10: 192. 1927.

A tree of about 15 meters with rather harshly strigose-hirsute foliage and growing parts; petioles densely and shortly hirsute, to

25 cm. long; leaves 3–5-lobed, with narrow, deep sinuses, the segments short-acuminate, elliptic, the largest middle one 25–35 cm. long and 15 cm. wide; staminate inflorescence 2–many times irregularly branched, reddish brown with dense pubescence of granular and club-shaped hairs intermixed, the flowers sessile and glomerulate, their linear, more or less dilated segments ciliate at the apex, barely 1.5 mm. long, exceeding the filaments.—Trunk about 17 cm. in diameter, with few branches at 6 meters. Fruit edible. Neg. 11625.

Loreto: Mouth of Río Santiago, 160 meters, *Tessmann 4642*, type. Streamlet near mouth of Río Santiago, 400 meters, *Mexia 6201;* a tree of 14 meters, the leaves and twigs inhabited by small ants. "Uvilla."

Pourouma Tessmannii Mildbr. Notizbl. Bot. Gart. Berlin 10: 192. 1927.

Glabrous or lightly pubescent except for the more or less deeply 3-lobed leaves, these silvery beneath with an appressed tomentum; petioles sulcate, to 15 cm. long; stipules 8 cm. long, acuminate; leaves acuminate, 3-nerved from the base, 20 cm. long; staminate inflorescence 7 cm. long, the peduncle as long, the branches and branchlets chestnut-brown, with a dense covering of clavate hairs; flower glomerules dense, the perianth segments subulate-linear, closely white-pubescent, about 1.5 mm. long, the filaments half as long.—A tree of 20 meters, branching at 12 meters, with a trunk 25 cm. in diameter. Inflorescence early greenish yellow, in anthesis bright brown, becoming dark brown. Neg. 11626.

Loreto: Mouth of Río Santiago, 160 meters, *Tessmann 4236*, type. Yurimaguas, 200 meters, in forest, *Williams 4688*. "Setico."

Pourouma triloba Trécul, Ann. Sci. Nat. III. 8: 104. 1847. *P. triloba* Klotzsch, Linnaea 20: 526. Oct., 1847.

Perhaps only a less pubescent variety of *P. palmata;* pistillate flowers pubescent; staminate glomerules numerous, with the stamens about 5 mm. thick; fruit oblong-obovate, crustaceous, dehiscent by two valves. Neg. 11623.

Huánuco: Macora, *Ruiz*, type. Pampayacu, *Sawada 21*.

Pourouma Ulei Warb. Bot. Jahrb. 40: 132. 1907.

A tree, the branches and petioles slightly tomentose or glabrate; leaves long-petiolate, deeply cordate at the base, with usually overlapping basal lobes, smooth and glabrous above, closely and minutely

white-tomentose beneath, the broad lobes abruptly short-acuminate. Neg. 11627.

Loreto: In pasture, El Recreo, 200 meters, *Williams 3984*. Amazonian Brazil. "Uvilla."

4. COUSSAPOA Aubl.

Rather similar to *Pourouma*, but both sorts of flowers capitate, the pistillate heads solitary or often few. Leaves entire, the petioles often about half as long. Stigma capitate-penicillate.—Tall trees with the name "chichillica," the trunks thick, the foliage abundant, the fibers of the bark serving for the manufacture of coarse baskets, sacks for the collection of coca and fruits, and various other articles; it is used also to fasten and join timbers and beams (Ruiz & Pavón). Species very similar and the characters accepted as definitive may be variable.

Some of the following names by Trécul are in conflict with those of Klotzsch for the same year (1847), but the former were published in August while the latter probably appeared toward the last of the year. *Linnaea* for this year consists of 12 numbers, the correction page at the end of vol. 20 being signed as written only in August and a much earlier article is signed also as written at this date (Nelly Dubugnon, Conservatoire Botanique, Geneva).

Branchlets, especially apically, very villous or setose.

Leaves broadly rounded and emarginate at the apex. *C. emarginata.*

Leaves acute or obtuse at the apex, not emarginate.

Branchlets long-setose; leaves glabrate or lightly tomentose beneath ..... *C. hirsuta.*

Branchlets hirsute-villous.

Leaves densely white-tomentose beneath ..... *C. villosa.*

Leaves minutely hirsutulous and cobwebby beneath. *C. vellerea.*

Branchlets glabrate or shortly pubescent.

Leaves acute, smooth and glabrous above.

Branchlets puberulent-hirsutulous; leaves 8–17 cm. long.

Leaves glabrous beneath or the nerves puberulent. *C. ovalifolia.*

Leaves araneose-tomentulose beneath ..... *C. Tessmannii.*

Branchlets glabrous; leaves 20–30 cm. long ..... *C. acutifolia.*

Leaves rounded or retuse apically, often more or less asperous.
Pistillate heads solitary.
Leaves scabrous on the upper surface.....*C. asperifolia.*
Leaves smooth on the upper surface.....*C. grandiceps.*
Pistillate heads cymose.
Leaves finely short-hirsutulous beneath.....*C. magnifolia.*
Leaves white-lanuginose beneath, as well as sparsely hirsutulous.....*C. Standleyi.*

Coussapoa acutifolia Klotzsch, Linnaea 20: 529. 1847.

With the large leaves of *C. magnifolia* Trécul, but these obviously acute and glabrous except for the puberulent nerves beneath; in these respects apparently like *C. ovalifolia* Trécul, with much smaller and crowded leaves. Neg. 11555.

Huánuco: Cochero, *Ruiz & Pavón.*

Coussapoa asperifolia Trécul, Ann. Sci. Nat. III. 8: 96. 1847.

Branchlets soon glabrate or glabrous; leaves often almost square-sided, about 15 cm. long or smaller, typically very scabrous above and rather softly short-pubescent beneath and finely reticulate; petioles 1.5–2 cm. long; staminate heads cymose; perianth oblong, with short, glabrous teeth; filaments about as long as the flower; pistillate flowers in a solitary head, tubular-urceolate; style very short, the stigma capitate, villous; fruits very numerous, oblong, exteriorly somewhat fleshy.—Both the Peruvian specimens are essentially glabrous but are typical in the obtuse or retuse leaves. *C. Martiana* Miq. has broadly ovate, somewhat acute leaves, often larger and white-arachnoid beneath, in which respect it resembles *C. subincana* Mart. with the leaves somewhat peltate. Neg. 11556.

Amazonas: Moyobamba, *Weberbauer 4472* (det. Mildbraed).—Junín: La Merced, *5547.* British Guiana.

Coussapoa emarginata Killip, sp. nov.

Arbor 12–15-metralis, ramulis crassis densissime pilis longis fulvis mollibus pilosis dense foliatis; stipulae lineari-lanceolatae 6.5 cm. longae attenuatae extus dense longipilosae; folia mediocria longipetiolata coriacea, petiolo crasso 4.5–5.5 cm. longo dense piloso; lamina late obovato-ovalis vel rotundato-ovalis 13–17.5 cm. longa 9–12 cm. lata apice late rotundata et leviter vel profunde emarginata, basi rotundata, supra in sicco fusca ad costam et interdum ad nervos pilosa, aliter glabra, nervis non elevatis, subtus pallida ubique sub-

sparse adpresse tomentulosa, ad costam nervosque pilis longis ochraceis sericeo-pilosa, costa crassa elevata, nervis lateralibus utroque latere circa 15 rectis elevatis angulo semirecto obliquis in marginem desinentibus, nervulis obscuris numerosissimis rectis arcte parallelis; inflorescentia (immatura tantum visa) paucicapitata densa, capitulis parvis dense paucifloris breviter pedunculatis, pedunculo petiolo aequilongo.

Loreto: Mishuyacu, 100 meters, in forest, *Killip & Smith 29955* (U. S. Nat. Herb., type; duplicate in Herb. Field Mus.).

Coussapoa grandiceps Killip, sp. nov.

Arbor, ramulis crassis sparse in statu juvenili hirtello-puberulis cito glabratis; stipulae magnae circa 7 cm. longae pallido-tomentosae; folia magna coriacea, petiolo crasso 6–10 cm. longo striato glabrato; lamina ovali-ovata 24–32 cm. longa 16–19 cm. lata versus apicem rotundatum paullo angustata, basi late rotundata brevissime cordata, supra glabra laevis, subtus minute arcte pallido-tomentella, nervis lateralibus utroque latere circa 18 rectis elevatis, venulis ultimis creberrimis prominentibus arcte parallelis; capitula feminea geminata, pedunculis simplicibus crassis 5–6.5 cm. longis leviter tomentulosis glabrescentibus, capitulis densissimis subglobosis multifloris 1.5 cm. diam.

Loreto: Yanón, wooded banks of lower Río Huallaga, 135 meters, *W. J. Dennis* (*Killip & Smith 29246;* type in U. S. Nat. Herb.); a tree of 12–15 meters. Puerto Arturo, Yurimaguas, 200 meters, in forest, *Williams 5349*. Apparently conspecific is *Williams 4179* from Yurimaguas. "Renaco caspi."

Coussapoa hirsuta Trécul, Ann. Sci. Nat. III. 8: 97. 1847. *C. setosa* Klotzsch, Linnaea 20: 528. 1847.

Branchlets conspicuously long-setose toward the tips; petioles to 3 cm. long, evanescently pilose; leaves obovate, rounded at the base, acute, about 15 cm. long, 10 cm. wide or narrower, slightly floccose on the nerves beneath; pistillate heads cymose-corymbose, the urceolate flowers thin and including the subdrupaceous fruit; seed irregular.—Mildbraed (in herb. Madrid) maintains the Klotzsch name. Neg. 11560.

Huánuco: Macora, *Ruiz & Pavón*.

Coussapoa magnifolia Trécul, Ann. Sci. Nat. III. 8: 98. 1847. *C. Ruizii* Klotzsch, Linnaea 20: 529. 1847.

Suggesting *C. asperifolia* Trécul, but the leaves often 30 cm. long and nearly as wide; lateral nerves 6–7; petioles glabrate, to 10

cm. long; pistillate heads several; ovary subobovate.—Mildbraed employs the Klotzsch name. Neg. 11557.

Huánuco: Cochero, *Poeppig 1371; Ruiz & Pavón*, type.—Junín: La Merced, 600 meters, *5447*.

Coussapoa ovalifolia Trécul, Ann. Sci. Nat. III. 8: 95. 1847. *C. puberula* Klotzsch, Linnaea 20: 529. 1847.

Petioles 4–6 cm. long; leaves ovate or ovate-oblong, rounded at the base, mostly 8–12, rarely 15, cm. long, half as wide; lateral nerves 13–15, the veins obvious; pistillate heads umbellate-cymose, the flowers puberulent only at the tip; stigma penicillate; ovary oblong.—Smoothish forms of *C. asperifolia* may be distinguished by their obtuse leaves and solitary pistillate heads. *C. trinervia* Mildbr. is glabrous, with strongly 3-nerved leaves. *C. nitida* Miq. is sparsely hirtellous and the pistillate flowers glabrous. Neg. 11559.

Junín: Río Paucartambo Valley, 700 meters, *Killip & Smith 25341;* a tree of 9–12 meters. La Merced, 600 meters, *5594*.—Huánuco: Chinchao, Pillao, Posuso, etc., *Ruiz*.—Loreto: Puerto Meléndez, *Tessmann 3922* (det. Mildbraed).—Río Acre: *Ule 9316?* (det. Mildbraed).—Without locality: *Ruiz*.

Coussapoa Standleyi Macbr., sp. nov.

C. magnifoliae affinis; petiolis (12 cm. longis), nervis venisque minutissime parceque hispidulis; foliis apice rotundato-obtusis ad 40 cm. longis supra glabris subtus dense arachnoideis, margine valde undulato-repandis; nervis lateralibus circa 16 prominentibus; pedunculis dense ferrugineo-tomentuloso-hirsutulis; capitulis fem. circa 15 plerumque geminato-connatis, dense hirsutulis.—Seemingly well distinct in character of pubescence, and the numerous pistillate heads (these are undeveloped). Mildbraed referred the specimen to *C. magnifolia* with a query. The pubescence suggests that of the different *C. vellerea*. Neg. 29511.

Huánuco: Huamalíes, 700–800 meters, *Weberbauer 3702*, type (Hb. Berlin).

Coussapoa Tessmannii Mildbr. Notizbl. Bot. Gart. Berlin 10: 413. 1928.

Youngest branchlets rusty-hirsutulous; leaves ovate, nearly truncate at the base, triangular-acute at the apex, 13–17 cm. long, 9–12 cm. wide, on stout petioles a third as long; lateral nerves about 11, the veins and veinlets beneath densely reticulate and prominent, the areoles thereby sunken; pistillate inflorescence many-headed,

on peduncles 1.5–2 cm. long, the short, thick branchlets somewhat hirsute and granular; heads 5 to nearly 10 mm. thick, sometimes geminate-connate; flowers 3 mm. long, glabrous, the shorter bracts filiform or slightly widened at the apex.—Differs from *C. puberula* in the pubescence. *C. intermedia* Mart. has very fine, scarcely at all reticulate or obvious veins. Neg. 11562.

Loreto: Mouth of Río Santiago, *Tessmann 4673*, type. "Renaco."

Coussapoa vellerea Klotzsch, Linnaea 20: 527. 1847.

Similar to *C. villosa*, but the leaf pubescence not at all tomentose, the arachnoid hairs evanescent; leaves to 40 cm. long, 30 cm. wide; peduncles 5 cm. long, to 11 cm. in fruit, geminate, the fruiting perianth reddish-brown-hirsute, 3 mm. long.

Huánuco: Macora, *Ruiz & Pavón*, type.

Coussapoa villosa Poepp. & Endl. Nov. Gen. & Sp. 2: 33. *pl. 147*. 1838.

Branches, petioles, bracts, and peduncles villous-hirsute, often even shaggy; leaves ample, sometimes 30 cm. long and a third as broad or larger, broadly ovate and more or less cordate, acute or obtuse; staminate heads few to rather many, corymbose-paniculate; bractlets spatulate, often emarginate; perianth turbinate, trifid, pubescent; pistillate heads solitary or geminate; perianth contracted below the apex, oblong; style slender; fruit ovate-oblong.—*C. Sprucei* Mildbr. has oval-oblong leaves, subvelvety-pubescent beneath. Neg. 11564.

Huánuco: Casapí, *Poeppig*, type.—Loreto: Mouth of Río Santiago, *Tessmann 4696* (det. Mildbraed). Santa Rosa, Lower Río Huallaga, 135 meters, *Killip & Smith 28800* (det. A. C. Smith). Ecuador.

5. FICUS L. Fig

By Paul C. Standley

Small or large trees with milky sap; leaves entire in the native American species; easy of recognition among all American trees by the form of the fruit, similar to that of the cultivated fig, but in the wild trees much smaller, consisting of a hollow, more or less fleshy receptacle, with a small apical opening (ostiole), this closed by small, overlapping scales; flowers minute, densely inserted all over the interior wall of the receptacle.—A large genus in tropical America, doubtless with more Peruvian representatives than are listed here. A few other Peruvian species, in fact, are represented in the herba-

rium by fragmentary material, insufficient for their diagnosis. The plants often or usually begin life as epiphytes, the seeds germinating upon a branch of some host tree. The seedlings send down aerial roots that develop into long, cord-like stems which finally envelop and strangle the host. The wood is soft and of no economic importance. The larger fruits are fleshy, sweet, and edible (especially in the subgenus *Pharmacosycea*). They are seldom eaten by people but are much sought by birds and other animals. The latex yields a kind of rubber. From the bark the ancient Mexicans prepared paper upon which some of their manuscripts were written.

Receptacles solitary in the leaf axils; leaves often scabrous; involucre 3-lobate. Subgenus *Pharmacosycea.*

Leaf blades deeply emarginate at the base.....*F. Macbridei.*

Leaf blades not emarginate at the base.

Leaves gradually acute or acuminate, or cuspidate-acuminate. *F. glabrata.*

Leaves obtuse or acutish, sometimes abruptly short-acute.

Leaves with very numerous, close lateral nerves. *F. anthelmintica.*

Leaves with few distant lateral nerves.....*F. radula.*

Receptacles geminate; leaves never scabrous; involucre 2-lobate. Subgenus *Urostigma.*

Branches hirsute with long, spreading, brown hairs. Fruit sessile.

Fruits large, about 12 mm. in diameter, densely hirsute. *F. juruensis.*

Fruits about 6 mm. in diameter, glabrate.....*F. Llewelyni.*

Branches not hirsute, usually glabrous or nearly so.

Receptacles small, mostly 4–6 mm. in diameter.

Leaves large, about 35 cm. long, attenuate to the base, narrowly oblanceolate-oblong.....*F. caballina.*

Leaves much smaller, chiefly 5–14 cm. long.

Young branches and petioles glabrous. Fruit glabrous.

Leaves 3-nerved at the base, commonly about 6 cm. long. *F. nitida.*

Leaves not 3-nerved at the base, mostly 7–12 cm. long. *F. Matthewsii.*

Young branches and petioles, at least at first, strigose or appressed-pilose.

Receptacles strigose at first, becoming glabrate. *F. Killipii.*

Receptacles glabrous from the first.

Nerves of the leaves very oblique, salient on the lower surface..... *F. Weberbaueri.*

Nerves divergent at an angle of more than 60 degrees, not elevated on the lower surface. . *F. casapiensis.*

Receptacles large, 8–20 mm. in diameter or even larger.

Fruits sessile.

Leaves rounded at the apex; involucre about half as long as the fruit..... *F. Urbaniana.*

Leaves abruptly cuspidate-acuminate; involucre small and inconspicuous..... *F. paraensis.*

Fruits pedunculate.

Leaves narrowed to the acute or obtuse base. . . *F. gemina.*

Leaves broad toward the truncate or shallowly cordate base. *F. Ruiziana.*

Ficus anthelmintica Mart. Syst. Mat. Med. Bras. 88. 1843. *Pharmacosycea anthelmintica* Miq. Lond. Journ. Bot. 7: 66. 1848.

A large tree, glabrous throughout; stipules narrow, long-attenuate, as much as 11 cm. long; leaves long-petiolate, the blades elliptic-oblong or elliptic, 13–23 cm. long, 5.5–10 cm. wide, acute or acutish, subacute to rounded at the base, the lateral nerves close together, prominent beneath, slender, 15–25 or more on each side, diverging at a wide angle; receptacles pedunculate or almost sessile, globose, commonly 2–2.5 cm. in diameter.—Illustrated, Mart. Fl. Bras. 4, pt. 1: *pl. 25, f. 2.*

Junín: La Merced, 600 meters, *5295;* a large tree with widely spreading, dense crown.—Loreto: Iquitos, in 1932, *W. G. Scherer;* at 100 meters, *Killip & Smith.* Pebas, in forest, *Williams 1867.* Widely distributed in Brazil. "Ojé," "huito."

The sap (leche de ojé) and bark (corteza de ojé) are used medicinally in the region of Iquitos, particularly as a local remedy for tertian fevers.

Ficus caballina Standl., sp. nov.

Omnino glabra, ramulis crassis ut videtur dense foliatis ochraceis; stipulae non visae; folia inter maxima subcoriacea breviter petiolata, petiolo crasso 1.5 cm. tantum longo; lamina anguste oblanceolato-

oblonga circa 36 cm. longa et 11 cm. lata obtusa basin versus longe sensim attenuata, basi ipsa attenuato-cuneata, supra in sicco brunnescens, costa nervisque prominentibus, costa gracili subtus elevata, nervis lateralibus utroque latere circa 15 gracilibus prominentibus angulo lato divergentibus fere rectis versus marginem inaequaliter conjunctis; receptacula numerosa ut videtur ex axillis defoliatis nascentia globosa 5–6 mm. diam. glabra, ostiolo plus minusve elevato, involucro bilobo, lobis brevibus late rotundatis vix 2.5 mm. longis; pedunculi graciles 6–8 mm. longi.

Loreto: Caballo-cocha, in forest, *Williams 2075* (type in Herb. Field Mus. No. 608,842). "Renaquillo."

A species easily recognized by the very large, long and narrow leaves and remarkably small receptacles.

Ficus Carica L. Sp. Pl. 1059. 1753.

The common fig ("higo"), native of the Mediterranean region, is cultivated frequently in various parts of Peru. It differs from all American species in its deeply lobate leaves.

Ficus casapiensis Miq. Ann. Mus. Bot. Lugd. Bat. 3: 298. 1867. *Urostigma casapiense* Miq. Lond. Journ. Bot. 6: 548. 1847.

Branchlets thick, sparsely pilose or glabrate; stipules 2 cm. long or less, acuminate, dorsally sericeous-pilose with long, pale hairs; leaves petiolate, coriaceous, the blades oblong to oblong-obovate, very abruptly short-acuminate, very obtuse to subacute at the base, sparsely pilose beneath along the costa, elsewhere glabrous, the lateral nerves about 17 pairs, divergent at a wide angle, very slender; receptacles sessile, glabrous, globose, "slightly larger than a pea." —The specimens from Loreto are referred here with some doubt.

Huánuco: Casapí, *Mathews*, type.—Loreto: Santa Rosa, 135 meters, in forest, *Killip & Smith 27846*. Puerto Arturo, 135 meters, in forest, *Killip & Smith 27846*.

Ficus gemina Ruiz ex Miq. in Mart. Fl. Bras. 4, pt. 1: 98, in syn. 1853. *Urostigma geminum* Miq. loc. cit.

A tree of 5–8 meters or more, glabrous throughout, the branches relatively slender; stipules small and narrow, about 1 cm. long; leaves slender-petiolate, subcoriaceous, the blades ovate-elliptic to oblong-elliptic, commonly 6–12 cm. long and 2–5 cm. wide, acuminate or abruptly acute, obtuse or subacute at the base and rather conspicuously triplinerved, the lateral nerves 8–15 on each side, very slender, divergent at a rather wide angle; receptacles short-peduncu-

late, globose, generally 7–8 mm. in diameter, often spotted with red, the ostiole plane or conspicuously elevated.—Neg. 11713. Illustrated, Mart. Fl. Bras. 4, pt. 1: *pl. 27, f. 3.*

Huánuco: Pampayacu, *Sawada 13, 17.* Posuso, *Ruiz,* probably type material.—Junín: La Merced, 600 meters, along stream, *5484,* a large tree with spreading crown, the bark white; *Killip & Smith 23463,* fruits yellow to orange with darker spots.—Loreto: Mishuyacu, 100 meters, *Killip & Smith 29899.* Moyobamba, *Weberbauer 4523.*—San Martín: Tarapoto, *Ule 6510; Williams 5502; Spruce 4274.* Chazuta, 260 meters, in forest, *Klug 3972.* Also in Colombia, and reported from Brazil and Surinam. "Renaco," "higo silvestre."

Ficus glabrata HBK. Nov. Gen. & Sp. 2: 47. 1817.

A large tree, glabrous throughout; stipules narrow, usually not more than 2 cm. long, often much smaller; leaves petiolate, the blades elliptic-oblong to elliptic-oval, 12–25 cm. long, 5–10 cm. wide, abruptly acute or acuminate, sometimes caudate-acuminate, acute to obtuse at the base and 3–5-nerved, pale green when dried, the lateral nerves remote, usually 8–15 on each side, rather stout, divergent at a wide angle; receptacles pedunculate, globose, 1.5–4 cm. in diameter, glabrous or obscurely scaberulous, the ostiole prominent, the involucre very small.

Junín: Chanchamayo, *Isern 2329.*—Loreto: Lower Río Huallaga, 135 meters, *Killip & Smith 29009,* fruit rich purple. San Antonio, 145 meters, *Williams 3548; Killip & Smith 29458,* fruit deep and pale green mottled. Iquitos, 120 meters, edge of forest, *Williams 3747.* Río Masana, *Williams 100.* Balsapuerto, 150–350 meters, *Killip & Smith 28381.*—San Martín: Tarapoto, *Williams 6311, 5463.* San Roque, *Williams 7628.* Extending to Brazil and northward through Central America. "Ojé." Called "higuerón" in Ecuador.

Ficus juruensis Warb. Bot. Jahrb. 40: 140. 1907, nomen.

A small or medium-sized tree, the branchlets densely brownish-hirsute with spreading hairs; stipules brown-hirsute, often long-persistent; leaves short-petiolate, the blades obovate-oblong to elliptic or almost oval, mostly 7–15 cm. long and up to 6.5 cm. wide, acuminate or sometimes obtuse and abruptly short-pointed, coriaceous, rounded or obtuse at the base, scabrous and somewhat pilose on the upper surface or finally glabrate, beneath densely short-pilose with soft, brownish hairs, the lateral nerves about 10 pairs, very prominent beneath, almost straight, ascending at a rather wide angle; receptacles sessile, globose, about 12 mm. in diameter, densely

brown-hirsute. Negs. 11706, 11710 (determined by Warburg as a new species; *Ule 5271*).

Junín: Huacapistana, 1,800 meters, *5819; Weberbauer 2321*.—Loreto: Lower Río Huallaga, 200 meters, *Williams 4702*. Without locality, *Ule 5271*. Amazonian Brazil.

Ficus Killipii Standl., sp. nov.

Arbor 6–30-metralis, ramulis crassiusculis griseis vel fuscis rimosis primo sparse strigosis cito glabratis dense foliatis; stipulae circa 1 cm. longae anguste triangulares longiattenuatae puberulae vel glabratae; folia petiolata coriacea, petiolo crassiusculo 1–1.5 cm. longo glabrato; lamina oblonga vel obovato-oblonga 6–12.5 cm. longa 2.5–5 cm. lata obtusa vel breviter abrupte obtuso-acuminata, basi obtusa vel anguste rotundata atque 5-nervia, costa utrinque prominente, nervis lateralibus utrinque prominentibus utroque latere 9–11 tenuibus angulo latiusculo divergentibus prope marginem arcuato-conjunctis fere rectis; receptacula geminata sessilia parva globosa 5 mm. diam. primo sparse strigosa cito glabrata, ostiolo paullo prominente, involucro brevi, lobis late rotundatis.

Junín: Río Paucartambo Valley, near Perené Bridge, 700 meters, in forest, *Killip & Smith 25252* (Herb. Field Mus. No. 616,750, type).—Ayacucho: Choimacota Valley, 700 meters, *Weberbauer 7538*.

Weberbauer reports the local name of the latex as "aceite María," and states that it is taken by women as a remedy for sterility.

Ficus Llewelyni Standl., sp. nov.

Arbor, ramulis crassis ochraceis vel brunnescentibus primo pilis longis brunneis dense patenti-hirsutis; stipulae circa 1 cm. longae dense brunneo-hirsutae; folia mediocria petiolata subcoriacea, petiolo crasso vel subgracili 8–15 mm. longo hirsuto vel glabrato; lamina obovato-elliptica vel oblongo-elliptica 7.5–12 cm. longa 4–6.5 cm. lata apice obtusa vel rotundata et abrupte breviter acutata, basi obtusa vel anguste rotundata, supra in sicco fuscescens glabra, costa nervisque impressis, subtus praesertim ad nervos brunneo-pilosa vel subhirsuta, costa gracili elevata, nervis lateralibus utroque latere 8–12 gracilibus prominentibus fere rectis obliquis marginem fere attingentibus; receptacula geminata sessilia globosa circa 6 mm. diam. primo strigosa cito glabrata, ostiolo prominente, involucro parvo bilobo extus strigoso.

Loreto: Caballo-cocha on the Amazon, in forest, *Williams 2308* (Herb. Field Mus. No. 608,283, type).—San Martín: Chazuta, 260

meters, in forest, epiphytic, *Klug 4049*.—Huánuco: Vitoc, *Ruiz & Pavón*.—Junín: Chanchamayo, *Isern 2231*.

Ruiz and Pavón assigned to the plant an unpublished specific name now untenable.

Ficus Macbridei Standl., sp. nov.

Arbor 10-metralis, ramulis crassissimis primo albido-pilosis cito glabratis, internodiis brevibus vel elongatis; stipulae angustae attenuatae circa 5.5 cm. longae glabrae; folia inter maxima petiolata subcoriacea, petiolo crasso circa 7 cm. longo glabrato; lamina obovato-elliptica circa 30 cm. longa et 17 cm. lata apice obtusa et abrupte breviter acutata, basin versus paullo angustata, basi ipsa anguste rotundata et profunde (6 mm.) emarginata, supra glabra costa venisque vix elevatis, subtus praesertim ad nervos scaberula vel ad costam breviter hirtella, costa crassa elevata, nervis lateralibus utroque latere circa 12 crassiusculis remotis angulo lato divergentibus prope marginem arcuato-conjunctis; receptacula solitaria sessilia (?) globosa 2 cm. diam. dense pilis albidis hirtello, involucro parvo breviter trilobo.

Huánuco: Pampayacu, mouth of Río Chinchao, 1,050 meters, *Macbride 5090* (Herb. Field Mus. No. 536,141, type).

Ficus Matthewsii Miq. Ann. Mus. Bot. Lugd. Bat. 3: 298. 1867. *Urostigma Matthewsii* Miq. Lond. Journ. Bot. 6: 549. 1847. *F. oblanceolata* Rusby, Bull. N. Y. Bot. Gard. 4: 446. 1907.

A small or medium-sized tree, glabrous throughout; petioles short or elongate, the blades obovate-oblong to narrowly oblanceolate-oblong, mostly 5.5–12 cm. long and 2.5–4 cm. wide, acute or obtuse, the extreme tip obtuse, acute or obtuse at the base, coriaceous, the costa very prominent beneath, the lateral nerves fine, very numerous, closely parallel, divergent often at almost a right angle; receptacles numerous, deep red or pinkish or yellowish dotted with red, short-pedunculate, globose, 5–6 mm. in diameter, the involucre minute.

Type collected in Peru by Mathews.—Huánuco: Huacachi, 1,950 meters, the trunk attached to a rock, *3866*.—Junín: La Merced, *Weberbauer 1881*.—Loreto: Iquitos, 120 meters, *Williams 8012, 3737, 8079, 3694, 3784; Killip & Smith 27077*. Timbuchi, Río Nanay, *Williams 927*. Mishuyacu, 100 meters, in forest, *Killip & Smith 29897*. Bolivia to Venezuela. "Renaco."

Ficus nitida Thunb. Ficus Diss. 10. 1786.

Glabrous throughout; a small or often a very large tree with broad crown and numerous aerial roots; stipules narrow, attenuate, about 1 cm. long; leaves small, petiolate, coriaceous, the blades obovate, acute at the base, the apex acute or acutish but the tip obtuse, the lateral nerves fine and inconspicuous; receptacles sessile, globose, about 6 mm. in diameter.

An Asiatic species, said to be the most frequent street tree of Lima. It is planted commonly for shade and ornament in many parts of tropical America.

Ficus paraensis Miq. Ann. Mus. Bot. Lugd. Bat. 3: 298. 1867. *Urostigma paraense* Miq. Lond. Journ. Bot. 6: 534. 1847.

A small or medium-sized tree, glabrous throughout; stipules 3 cm. long or less, narrow, attenuate, caducous; leaves medium-sized, subcoriaceous, petiolate, the blades oblong to oval-oblong, mostly 10–18 cm. long and 6–8 cm. wide, abruptly acuminate or sometimes caudate-acuminate, subacute to broadly rounded and often emarginate at the base, the lateral nerves numerous, divergent at a wide angle; receptacles sessile or nearly so, globose, about 1.5 cm. in diameter, the ostiole elevated, the involucre small and inconspicuous.—Illustrated, Mart. Fl. Bras. 4, pt. 1: *pl. 28, f. 1.* Neg. 18826.

Huánuco: Pampayacu, *Sawada 4.*—Junín: La Merced, 600 meters, river bank, *5571; Killip & Smith 23711*, the fruit green striped with purple. Pichis Trail, 500 meters, *Killip & Smith 26213*. Río Perené, 600 meters, *Killip & Smith 25237.*—Loreto: Yurimaguas, 200 meters, edge of forest, *Williams 3803*. Puerto Arturo, 200 meters, *Williams 5034*. Caballo-cocha, *Williams 2171*. Manfinfa, *Williams 1141*. Iquitos, 100 meters, in forest, *Killip & Smith 27484*. Amazonian Brazil; reported from British Guiana. "Renaco," "sacha-ojé."

Ficus radula Willd. Sp. Pl. 4: 1144. 1806. *Pharmacosycea radula* Liebm. Dansk. Vid. Selsk. Skrift. V. 2: 330. 1851.

A large or medium-sized tree, glabrous or the branches and leaves sometimes minutely puberulent; stipules narrow, attenuate, mostly 1–1.5 cm. long, caducous; leaves petiolate, coriaceous, the blades oblong to obovate or oval, 8–16 cm. long, 4–8 cm. wide, rounded or obtuse at the apex and abruptly short-pointed, obtuse or acutish at the 5-nerved base, often somewhat emarginate, the lateral nerves prominent beneath, 7–12 on each side, divergent at a wide angle; receptacles short-pedunculate, globose, 1.5–3 cm. in diameter, scabrous, the involucre very small.

Amazonas: Chachapoyas, *Weberbauer 4309*.—Junín: La Merced, 700 meters, *Killip & Smith 23534*. Río Perené, 600 meters, in forest, *Killip & Smith 25166*.—Loreto: Florida, 200 meters, in forest, *Klug 2099*.—Without locality: *Ruiz & Pavón*. Ranging northward to southern Mexico. "Zauchama caspi" (Klug).

Klug reports that the Indians prepare from the bark a kind of cloth that they use for their clothing. In various parts of the earth numerous Moraceae are or have been employed in much the same manner.

Ficus Ruiziana Standl., sp. nov.

Arbor alta fere omnino glabra, ramulis crassiusculis cinnamomeis vel ochraceis; stipulae anguste triangulares attenuatae caducae extus puberulae; folia mediocria vel majuscula subcoriacea longipetiolata, petiolo gracili glabro 3.5–10 cm. longo; lamina oblongo-ovalis vel ovali-elliptica 9–25 cm. longa 5.5–12 cm. lata apice rotundata vel obtusa et abrupte in acumen angustum acuminatum brevem contracta, basi late rotundata vel breviter cordata, glabra, in sicco viridescens vel brunnescens, costa nervisque supra prominentibus, costa subtus elevata gracili, nervis lateralibus utroque latere 8–16 remotis gracilibus prominentibus fere rectis angulo lato divergentibus prope marginem arcuato-conjunctis; receptacula globosa 12–15 mm. diam. pedunculata glabra geminata, ostiolo prominente, involucro bilobo, lobis patentibus late rotundatis vix ultra 2.5 mm. longis; pedunculi crassi 3–5 mm. longi.

Junín: La Merced, 1,200 meters, *Macbride 5795* (Herb. Field Mus. No. 536,824, type).—Huánuco: Cochero and Posuso, *Ruiz* (a tracing of a leaf in Herb. Berlin, apparently referable here).—Loreto: Santa Rosa, 200 meters, in forest, *Williams 4877*. Iquitos, 120 meters, *Williams 7998*. Caballo-cocha, in forest, *Williams 2114*.—Cuzco: Santa Rosa, Urubamba Valley, 1,200 meters, *Cook & Gilbert 1722*. Probably also in Amazonian Brazil. "Renaco."

Ficus Urbaniana Warb. in Urban, Symb. Ant. 3: 459. 1903.

An almost glabrous tree, the branchlets very thick; stipules broadly lanceolate, glabrous; leaves large, petiolate, the blades rounded-obovate to obovate or oblong-obovate, 14–22 cm. long, 7–14 cm. wide, broadly rounded at the apex, obtuse or rounded at the base, the lateral nerves 7–9 pairs, remote, ascending at a wide angle; receptacles sessile or nearly so, globose, 1.5–2.5 cm. in diameter or even larger, densely velutinous-pubescent, the large ostiole promi-

nent; involucre at first enclosing the young fruit, in age sometimes 2 cm. long, sericeous-puberulent.

Libertad: Below Hacienda Membrillal, 1,400 meters, *Weberbauer 6984*. Ecuador, Venezuela, and the West Indies.

Ficus Weberbaueri Standl., sp. nov.

Ramuli crassi ochracei sparse strigosi densiuscule foliati, internodiis brevibus; stipulae triangulares attenuato-acuminatae 5–6 mm. longae extus dorso strigosae; folia inter minora coriacea petiolata, petiolo 10–17 mm. longo gracili sparse strigoso; lamina elliptico-oblonga 6–10 cm. longa 2.5–4.5 cm. lata acuta vel subacuta, basi paullo angustata obtusa, glabra vel glabrata, in sicco brunnescens, costa supra elevata, nervis non elevatis, costa subtus elevata gracili, nervis lateralibus utroque latere 8–10 arcte elevatis fere rectis valde obliquis angulo fere semirecto adscendentibus juxta marginem arcuato-conjunctis; receptacula sessilia geminata parva globosa glabra 5 mm. tantum diam., ostiolo depresso, involucro bilobo extus sparse strigoso, lobis late rotundatis vix 2 mm. longis.

Cuzco: Casñipata, Prov. Paucartambo, 700–800 meters, *Weberbauer 6954* (Herb. Field Mus. No. 628,234, type).—Loreto: Iquitos, 125 meters, *Williams 8138*. "Renaco."

6. TROPHIS L.

Similar to *Chlorophora* but the pistillate flowers borne in short, dense racemes, tubular and 4-dentate. Fruit globose, scantily fleshy, edible.

Trophis racemosa (L.) Urban, Symb. Antill. 4: 195. 1905. *Bucephalon racemosum* L. Sp. Pl. 1190. 1753.

Leaves oblong-elliptic, 8–10 cm. long, entire; staminate aments 5–10 cm. long, the pistillate about 1 cm. long.—The Peruvian tree, sometimes 10–15 meters high, may have serrulate leaves, var. **meridionalis** (Bur.) Macbr., comb. nov. (*T. americana* L. var. *meridionalis* Bur. in DC. Prodr. 17: 253. 1873). The leaves and branchlets of the species are said to serve as a nutritious cattle food (Standley). Illustrated, Fawc. & Rendle, Fl. Jam. 3, pt. 1: 41.

San Martín: Juanjui, 400 meters, in forest, *Klug 3794*. Tarapoto, *Spruce 4521* (the var.); *Williams 6573, 6542*.—Loreto: Mouth of Río Santiago, *Tessmann 4083*. Yurimaguas, 135 meters, in forest, *Killip & Smith 27685*. Puerto Arturo, 200 meters, in forest, *Williams 5243* (narrow-leaved form). Florida, 200 meters, *Klug 2079*. Near mouth of Río Tigre, 115 meters, *Killip & Smith 27531*. Caballo-

cocha, in forest, *Williams 2086*. Río Masana, *Williams 201*. Soledad, 110 meters, *Killip & Smith 29576*. Huallaga, Yurimaguas, 200 meters, *Williams 4658*. Above Pongo de Manseriche, 210 meters, *Mexia 6303, 6262*. Ranging to Mexico and the West Indies. "Cuchara-caspi," "uspai-manchinga."

7. MORUS L. Mulberry

Reference: Bureau in DC. Prodr. 17: 237–249. 1873.

Flowers green, monoecious, each kind in separate aments. Seeds included in the succulent fruiting perianths which, borne densely in spikes, form the well known mulberry or "mora," *M. nigra* L. or *M. alba* L., both of which, Asiatic in origin, are sometimes cultivated in Peru. In addition, according to Bureau, there are the two following American species. Perhaps Herrera's reference in Contr. Fl. Dep. Cuzco, ed. 2. 65. 1921, to *M. nigra* as "growing wild in abundance in the Province of Convención, from Huiro to Echarati," should apply rather to one of the following.

Morus celtidifolia HBK. Nov. Gen. & Sp. 2: 33. 1817; 246.

Branches and branchlets slender, glabrous or somewhat pubescent; leaves ovate, rounded or cordate at the base, acuminate, scabrous above, hirtellous on the nerves beneath; stipules 1–10 mm. long; spikes laxly flowered, both the staminate and pistillate pedunculate, the peduncle at least 5 mm. long.—A tree to 9 meters tall, the wood valued in Ecuador for building purposes. Illustrated, Sarg. Man. Trees N. Amer. 305.

Peru: (*Mathews*). Extending north to Mexico.

Morus insignis Bureau in DC. Prodr. 17: 247. 1873.

Branchlets at first whitish-tomentose, the branches glabrous, flexuous; leaves broadly ovate, unequal at the subcordate base, acuminate, very scabrous above, more or less pubescent beneath, densely so in youth; stipules 2 cm. long; staminate spikes 4–8 cm. long, the peduncles 3–4 mm. long; fruiting spikes often greatly elongate, subsessile.

Peru: *Ruiz & Pavón*. Colombia; Costa Rica.

8. CHLOROPHORA Gaud. Fustic

Small trees or shrubs, variable vegetatively, spiny to unarmed, with entire to coarsely serrate or 3-lobed leaves, glabrate or hirtellous, but distinctive by its unisexual inflorescences, the staminate ament-like spikes or sometimes globose heads, the pistillate globose heads;

fruit many-seeded and semifleshy. Perianth 4-parted, that of the pistillate flower cupulate, thickened at the apex.

Branches armed with stout, recurved spines; staminate flowers capitate.....*C. brasiliensis.*

Branches unarmed or with straight spines; staminate flowers in slender aments.....*C. tinctoria.*

Chlorophora brasiliensis (Mart.) Standl., comb. nov. *Broussonetia brasiliensis* Mart. Flora 24: Beibl. 10. 1841. *Maclura brasiliensis* Endl. Gen. Suppl. 4: 34. 1847.

A shrub or small tree, almost glabrous, the branches armed with numerous long, abruptly recurved spines; leaves slender-petiolate, elliptic or broadly ovate, abruptly short-acuminate, obtuse at the base, thin, glabrous, entire or nearly so; staminate heads 5–6 mm. in diameter.—Illustrated, Mart. Fl. Bras. 4, pt. 1: *pl. 54.*

San Martín: Juan Guerra, 720 meters, *Williams 6855.* Brazil.

Described by the collector as a vine. The generic position of the plant is somewhat doubtful but for the present, at least, it may be placed in *Chlorophora.*

Chlorophora tinctoria (L.) Gaud. Bot. Freyc. Voy. 508. 1826. *Morus tinctoria* L. Sp. Pl. 986. 1753. *Maclura affinis* Miq. in Mart. Fl. Bras. 4, pt. 1: 155. 1853. *Maclura tinctoria* (L.) D. Don, var. *affinis* (Miq.) Bureau in DC. Prodr. 17: 230. 1873; var. *chlorocarpa* Bureau, op. cit. 229.

Leaves varying from lanceolate to elliptic, usually about 10 cm. long and several cm. wide, entire or serrate, on petioles 1 cm. long; staminate aments 3 to several cm. long, pedunculate as also the globose pistillate heads.—This tree is well known as the source of fustic dye-wood, furnishing the olive-drab of khaki and other tones in greens, browns, and yellows. Its light yellow wood, close-grained, durable and taking a high polish, is used in the manufacture of furniture, wheels, etc., in some parts of its range. Variable in leaf form. Illustrated, Mart. Fl. Bras. 4, pt. 1: *pl. 51, 52.*

Amazonas (?): (*Mathews 1981*). Yurimaguas, *Poeppig 2384.* —Without locality, *Ruiz & Pavón;* (*Mathews*).—Loreto: Río Ucayali, *Tessmann 3366.* Iquitos, 120 meters, *Williams 8040, 8050, 7217.* Río Nanay, *Williams 501, 672.* Caballo-cocha, *Williams 2441.* Parana-pura, 200 meters, *Williams 2441.*—San Martín: Pongo de Cainarachi, 230 meters, *Klug 2607.* Tarapoto, 750 meters, *Williams 5435.* Río Mayo, in forest, *Williams 6254.* Brazil to Mexico and the West Indies. "Insira," "insira caspi," "limulana."

9. SOROCEA St. Hil.

Small trees with subentire or spinulose-toothed leaves and laxly flowered, unisexual racemes or spikes. Staminate perianth present, 4-parted. Otherwise very similar to *Clarisia*.

Leaves spinulose-dentate.....*S. ilicifolia.*
Leaves, if toothed, repandly and bluntly.
Branchlets puberulent or glabrous.
Petioles 8–10 mm. long, or longer.
Leaves bluntly toothed; pedicels 5 mm. long, or longer.
S. Briquetii.
Leaves entire or repandly toothed; pedicels very short.
Leaves elliptic-obovate, to nearly 10 cm. wide or smaller.
S. Ulei.
Leaves elliptic-oblong, to 6 cm. wide or smaller..*S. opima.*
Petioles 2–5 mm. long.
Leaves glabrous.....*S. muriculata.*
Leaves finely pubescent beneath.....*S. Sprucei.*
Branchlets and especially the leaves beneath hirtellous..*S. hirtella.*

Sorocea Briquetii Macbr. Candollea 4: 311. 1931.

Glabrous except for a minute puberulence on the pistillate peduncle and pedicels; leaves firm-membranaceous, ovate-oblong-lanceolate, acute at the base, obtusely acuminate, mostly 10 cm. long and 3.5 cm. wide, irregularly serrate, especially above the middle, lustrous above and rather prominently net-veined, paler beneath, the about 10 principal lateral nerves arcuately joined before the margin; peduncle 5–7 mm. long; pedicels to 10 mm. long; fruit subglobose, 5 mm. thick; stigmas apparently acute. Neg. 11637.

San Martín: Tarapoto, *Spruce 4220*, type. Rumizapa, 800 meters, *Williams 6803*.

Sorocea hirtella Mildbr. Notizbl. Bot. Gart. Berlin 10: 183. 1927.

Young branchlets and leaf nerves beneath short-hirsute with spreading hairs; petioles 1 cm. long; leaves often slightly unequal at the rounded base, long-acuminate, mostly 10–13 cm. long and 6 cm. wide, glabrous above, the lateral nerves 10–12; rachis and peltate bracts hirtellous; perianth segments glabrate, to 2.5 mm. long and nearly 2 mm. broad.—A tree of 13 meters growing in upland woods, the trunk 21 cm. in diameter. Probably here belongs a Ruiz

and Pavón fruiting collection in Herb. Boissier with original label "*Clarisia* gen. nov.," on the basis of which the name *Clarisia nitida* (Allem.) Macbr. was proposed (see *Clarisia racemosa*). Its largest elliptic-acuminate leaves are over 20 cm. long, and 10–12 cm. wide. The axillary fruiting spikes are minutely pilose, 2–4 cm. long, the sessile, crowded, puberulent, globose fruits 5–6 mm. in diameter. Neg. 11640.

Loreto: Mouth of Río Santiago, 160 meters, *Tessmann 4016*, type. Mishuyacu, 100 meters, in forest, *Klug 739*. Caballo-cocha, *Williams 2092*.—Without locality: *Ruiz & Pavón* (?).

Sorocea ilicifolia Miq. in Mart. Fl. Bras. 4, pt. 1: 114. 1853.

Distinctive because of the spinulose leaf serration; a glabrous shrub or small tree with oblong-elliptic or broadly elliptic, sharply acuminate leaves on petioles 1 cm. long or often shorter and with racemes 4–6 cm. long.—*S. Klotzschiana* Baill. (*S. castaneifolia* Huber, Bol. Mus. Goeldi 5: 333. 1909) of the Amazon is not obviously different. Neg. 18810.

Junín: La Merced, *Weberbauer 1853*. Brazil.

Sorocea muriculata Miq. in Mart. Fl. Bras. 4, pt. 1: 113. *pl. 34*. 1853.

A densely leafy, slender, often flexuously branched shrub or small tree, the young branchlets, petioles, and inflorescences puberulent; leaves thin, oblong-elliptic, bluntly caudate-acuminate, acute at the base, mostly 8–10 cm. long and 3 cm. wide, paler and reticulate beneath; staminate spikes to 4 cm. long, the shorter pistillate ones often fasciculate; stigmas obtuse; fruit muricate-scabrous, thick-pediceled.—*S. Steinbachii* Mildbr., with mostly broader leaves, some with a tooth or two, might be sought here. Its fruits are mostly sessile. *S. amazonica* (Mart.) Miq. is scarcely distinguishable from *S. muriculata* except by its acute stigmas and smooth fruits.

San Martín: Near Moyobamba, *Klug 3566* (probably, in flower). —Loreto: Iquitos, 120 meters, *Williams 8010*. Mishuyacu, 100 meters, *Klug 153*. Mouth of Río Santiago, *Tessmann 4059, 4111* (det. Mildbraed), *5251*.

Sorocea opima Macbr. Field Mus. Bot. 11: 64. 1931.

A shrub with sparsely puberulent branchlets, densely puberulent pistillate racemes, and glabrous leaves; petioles 8 mm. long; leaves chartaceous, gray-green, subopaque, rather obscurely veined above, conspicuously reticulate beneath, the primary lateral nerves 10–12,

subrotund to the acutish or obtuse base, caudate-acuminate, the apex very broad (about 5 mm. at the middle) and up to 2 cm. long, entire or undulate-margined, the largest to 20, the smallest 10 cm. long; racemes extra-axillary, in fruit to 5 cm. long; fruit sessile or subsessile on the strongly thickened rachis, finally glabrous, 1.5 cm. long and 1 cm. thick, distinctly beaked.

Loreto: Caballo-cocha, in forest, *Williams 2357*, type.—San Martín: Zepelacio 1,200–1,600 meters, mountain forest, *Klug 3566*.

Sorocea Sprucei (Baill.) Macbr. Field Mus. Bot. 11: 16. 1931. *Pseudosorocea Sprucei* Baill. Adansonia 11: 296. 1875.

Apparently glabrous but under a lens the branchlet tips, petioles, and leaf nerves beneath more or less puberulent; branchlets short and stiff; petioles scarcely 5 mm. long; leaves subcoriaceous, lustrous above, paler beneath, mostly about 8 cm. long and 3 cm. wide, short-acuminate, entire; staminate spikes subsessile, 1–2 cm. long, the flowers about 2 cm. wide, minutely pubescent; pistillate inflorescence unknown.—Described as entirely glabrous.

San Martín: Near Tarapoto, *Spruce 4483*, type.

Sorocea Ulei Warb. ex Ule, Bot. Jahrb. 40: 141. 1907, nomen.

Glabrous, with thin, green or grayish leaves, all entire or more usually somewhat repand-toothed, elliptic-obovate, to 20 cm. long and nearly half as broad but mostly smaller, rather abruptly caudate, acuminate, the obtuse point about 1 cm. long, subobliquely and little narrowed, or even subrotund, to the acutish base; petioles to 1.5 cm. long, somewhat hirsutulous; petals glabrous, about 1 cm. long.—Described from *Ule 5871*, from Brazil. *S. Steinbachii* Mildbr. is apparently similar but its leaves are more nearly entire, much more cuneate below, and on usually shorter petioles. Neg. 25563.

Loreto: Río Ucayali, *Ule*. Cultivated, from the Ucayali, *Ducke 17044; Huber 6977*. Brazil.

10. CLARISIA R. & P.

Reference: Lanjouw, Recueil Trav. Bot. Néerl. 33: 254–276. 1936.

Trees or shrubs with alternate, bistipulate, petiolate, entire or dentate leaves. Flowers dioecious. Staminate spikes peduncled, axillary or in short racemes. Perianth none, the 1-staminate flowers intermixed with usually peltate bractlets. Pistillate flowers racemose or 1–several in small heads, the ovoid perianth adnate to the inferior or semi-inferior ovary. Style short, the exserted stigmas short or

long.—Tall, thick-trunked trees, the wood valuable. On incision, the trunk yields abundantly a white resin that in the air is brownish and somewhat elastic; it is excellent for water-proofing, and the Indians cover their blow guns, etc., with it (Ruiz & Pavón).

Leaves 2–4 cm. wide, abruptly short-acuminate.....*C. racemosa.*
Leaves 5–7 cm. wide, long caudate-acuminate.....*C. biflora.*

Clarisia biflora R. & P. Syst. 255. 1798.

A tree with numerous short, very leafy branchlets; petioles sulcate above, minutely appressed-pubescent; leaves oblong-obovate to obovate, rounded at the base, abruptly long-cuspidate, the acumen nearly 1.5 cm. long, 5–7 cm. wide, the blades 10–15 cm. long or longer, chartaceous, conspicuously reticulate and laterally nerved beneath, somewhat lustrous above, paler or often reddish brown beneath; stipitate pistillate flowers apparently binate at the base of the petiole; pedicels 2–3 mm. long, in fruit thick, 7 mm. long; perianth 4-bracted, 1 bract smaller than the others, suborbicular, subpeltate, fimbriate; perianth subglobose, about 5 mm. in diameter, the apical opening with a short, cylindric, irregularly lobed collar; styles 7 mm. long; fruit globose, 2 cm. in diameter. Neg. 29482.

Huánuco: Cochero, Chinchao, Posuso, Pillao, Chacahuasi, *Ruiz & Pavón.*—San Martín: Zepelacio, 1,100 meters, in forest, *Klug 3698;* a tree of 15 meters.—Without locality: *Weberbauer 7057.* "Yasmich," "piamich."

Clarisia racemosa R. & P. Syst. 255. 1798. *Soaresia nitida* Allem. Arch. Palestr. Scien. Rio Jan. 1: 142. 1858. *C. nitida* Macbr. Field Mus. Bot. 11: 15. 1931.

A tree to 30 meters, the ultimate branches numerous, slender; petioles glabrous or sparsely puberulous, 4–15 mm. long; leaves oblong-elliptic, rounded at the base, abruptly and obtusely acuminate, the acumen about 5 mm. long, lustrous above, olivaceous and paler beneath, the about 16 lateral nerves scarcely more prominent than the reticulate veins; staminate aments usually several in 1–2 axillary, racemosely arranged inflorescences, the common peduncle pubescent, 2–4 cm. long; spike peduncle 3 mm. long, the spikes 2–6 cm. long, linear-cylindric; stamens intermixed with variously shaped bracts, these sometimes coherent basally as a pseudoperianth, the rows of stamens bordered by subpeltate bractlets; pistillate flowers in racemiform panicles, often 2–3 in the leaf axils, the rachis pilose, 5–10 cm. long; pedicels 5–10 mm. long, densely pubescent; perianth

subtended by 4 broad, membranous-edged bracts, dentate and pubescent; perianth cupulate, glabrous except at the thin, obscurely lobed opening; stigmas 4–5 mm. long; fruit to 22 mm. long, 16 mm. broad, woody, the bracts persisting.—*C. ilicifolia* (Spreng.) Lanj. & Rossb., with acute-based, remotely dentate leaves, and *C. Spruceana* Lanj., with congested staminate spikes, the pubescence of the peduncles reflexed and uncinate, may be expected in Amazonian Peru. Ruiz and Pavón found the very durable and highly desirable wood already known and appreciated, describing the cortex as blood-red, the roots so red that they appeared to have bled. Ducke has observed that the leaves vary in size and acumination. He has described the bark as brown, verrucose, intensely red within as also the branchlets, the wood as yellow, finally becoming brown-yellow, the grain fine. Ruiz and Pavón recorded the vernacular name as "tulpay," Tessmann as "mashonasti," but the usual Brazilian term is "guariuba." Illustrated, Allem. op. cit. Neg. 29483.

Huánuco: Chinchao, Posuso, *Ruiz & Pavón.* Pampayacu, *Poeppig.* Cochero, *Poeppig 1087.*—Junín: La Merced, *Weberbauer 1885, 1912.*—Loreto: Yarina-cocha, *Tessmann 5433* (det. Mildbraed). La Victoria, *Williams 3097, 2684.*—Río Acre: *Ule 9317.* Cultivated from the Ucayali (*Ducke; Huber 6977*). Brazil. "Capinuri."

11. ANONOCARPUS Ducke

A dioecious tree, the staminate flowers in long spikes, the pistillate in elliptic heads forming at maturity a fleshy, subglobose, anona-like fruit. Staminate perianth 2–4-parted. Pistillate perianth fleshy, strongly compressed, obliquely tubular, the truncate apex with an elongate cleft from which are exserted the 2 subsessile stigmas.

Anonocarpus amazonicus Ducke, Archiv. Jard. Bot. Rio Jan. 3: 39. 1922.

A tree, the youngest branchlets and petioles somewhat puberulent, as also the leaf nerves beneath; petioles to 1 cm. long; leaves obovate-oblong, commonly 10–15 cm. long, 4–7 cm. wide, chartaceous; staminate spikes about 1 cm. long or shorter, the white-puberulent peduncles 1 cm. long; perianth and bractlets ciliate, about 1.5 mm. long; pistillate peduncle stout, about 1 cm. long, pubescent like the head, the latter to 5 cm. long and 4 cm. thick. Neg. 11628.

Loreto: Puerto Arturo, Yurimaguas, 200 meters, in forest, *Williams 5334.* Amazonian Brazil. "Mashunaste."

12. BROSIMUM Sw.

Reference: Ducke, Archiv. Jard. Bot. Rio Jan. 3: 29–30. 1922.

Shrubs or trees, marked among the Peruvian genera by the globose receptacles that are composed of numerous crowded, roundish, thin-edged bractlets intermixed with the sometimes exserted stamens, and contain one or more deeply imbedded pistillate flowers. —*Brosimopsis* S. Moore is similar in aspect but the receptacles are completely staminate or pistillate, the latter containing several flowers; it is allied to *Olmedia*. There are a number of Amazonian species, mostly very well marked in contrast to the Peruvian one, which seem, except *B. echinocarpum*, to center around *B. guianense* (Aubl.) Huber, Bol. Mus. Goeldi 5: 337. 1909, cf. Ducke. Apparently nearest ours is *B. Lecointei* (*B. Le Cointei*) Ducke, Archiv. Jard. Bot. Rio Jan. 3: 28. 1922, "aita." It has the small leaves of *B. Tessmannii*, but they are bluntly short-acuminate. Its heartwood is white, finally brownish rose instead of reddish purple as that of typical *B. guianense* ("bois de lettre" or "nuirapinima"), to which *B. Aubletii* has been referred. The former, however, has thicker, scarcely (and obtusely) pointed leaves. *B. discolor* Schott has, apparently, no clear difference, but the wood appears to be unknown. From herbarium material and descriptions it seems probable that our Brosimums, as here named, are distinct from *B. guianense*, to which Poeppig, Miquel, and Huber referred them, unless, in fact, there is but one variable specific entity, as Ducke suggests, for this particular group. He has transferred all the Brazilian species to the earlier name *Piratinera* Aubl., but *Brosimum* Sw. was already conserved. Pittier, however (Contr. U. S. Nat. Herb. 20: 99. 1918), retains the Aublet name for those species with 2 or more pistillate flowers, the staminate being provided with a perianth, a logical segregation in view of the acceptance of the presence or absence of a perianth as indicating generic demarcation elsewhere in the family. Ducke with reason rejects the character in this instance, although accepting it elsewhere.

Leaves faintly and remotely serrate, the largest 7 cm. wide. *B. echinocarpum.*

Leaves entire.

Leaves pubescent beneath.

Leaves obtusely acuminate, about 3 cm. wide. . . . *B. Aubletii.*

Leaves acutely acuminate, usually 1.5–2.5 cm. wide. *B. Tessmannii.*

Leaves glabrous beneath.

Leaves mostly 5–6.5 cm. wide, pale when dried, oval-elliptic, gradually acuminate.....*B. Uleanum.*

Leaves mostly 3–4 cm. wide, brownish when dried, oblong-oval, abruptly caudate-acuminate.....*B. paraense.*

Brosimum Aubletii P. & E. Nov. Gen. & Sp. 2: 34. 1838. *B. guianense* (Aubl.) Huber, as to synonymy only.

A small tree (as known) with many oblong-obovate, obtusely and shortly acuminate leaves mostly about 7 cm. long, lustrous above, grayish-puberulent beneath; staminate flowers unknown; pistillate peduncle nodding, only equaling the short petiole; bractlets thin at the margins; flowers 2 (always); fruit red, succulent, edible, the 2 seeds globose, smooth. Neg. 11654.

Loreto: Yurimaguas, *Poeppig 2413.* Guianas.

Brosimum echinocarpum P. & E. Nov. Gen. & Sp. 2: 34. *pl. 148.* 1838.

A shrub or tree with oblong-ovate leaves, subcuneate at the base and rather gradually long caudate-acuminate, distinctly but remotely serrate, thin, glabrous, to 15 cm. long and 7 cm. wide; heads axillary, peduncled, the pistillate rigidly setose, the pubescent setae 4–5 mm. long; fruit tuberculate-asperous, orange. Neg. 11656.

Loreto: Yurimaguas, *Poeppig 2255,* type.

Brosimum paraense Huber, Bol. Mus. Goeldi 6: 67. 1910.

A large tree, glabrous throughout; stipules very narrow, elongate, as much as 1.5 cm. long, brown; petioles short, the blades mostly oblong-elliptic and 4.5–10 cm. long, coriaceous, usually lustrous, the numerous lateral nerves diverging at a wide angle; fruiting heads about 12 mm. in diameter, short-stalked. Neg. 11662.

Loreto: Caballo-cocha, in forest, *Williams 2252.* Forest near Kokamas, Río Nanay, *Williams 725.* Forest between Río Nanay and Río Napo, *Williams 683.* Encanto, *Fox 93.* Amazonian Brazil and the Guianas. "Palo de sangre."

There is some doubt regarding the proper determination of the Peruvian tree, but the specimens agree rather well with authentic material of *B. paraense,* and are probably conspecific. The tree furnishes a valuable timber, used for furniture and other purposes.

Brosimum Tessmannii Mildbr. Notizbl. Bot. Gart. Berlin 10: 190. 1927.

Much like *B. discolor*, according to the author, but the papery leaves (mostly 6 cm. long) gradually long-acuminate, the lateral nerves about 10; staminate receptacle borne on a slender peduncle 1 cm. long, subglobose, the yellow, peltate bracts numerous above, few below.—A tree 25 meters high, the trunk diameter 55 cm., the branches much branched. A "magic tree," eaten by the magicians (Tessmann). Neg. 11667.

Loreto: Middle Río Ucayali, 155 meters, *Tessmann 3268*, type. Puerto Meléndez, *Tessmann 4860*. "Waira caspi."

Brosimum Uleanum Mildbr. Notizbl. Bot. Gart. Berlin 10: 191. 1927.

Glabrous except for the very minutely puberulent young branchlets, stipules, petioles (5 mm. long), peduncles (scarcely 1 cm.), and tips of the 2 large bracts; leaves usually oval-elliptic, obtuse at the base, short-acuminate, about 8 cm. long and 4–6.5 cm. wide, the 16 lateral nerves prominent beneath; receptacles green, subglobose, mostly staminate, 1 cm. broad, a few of the peltate bracts 1 mm. wide; stamens numerous, exserted, to over 2 mm. long; style branches puberulent, nearly 2 cm. long.—A tree 40 meters high with a trunk diameter of 1.25 meters. In upland forest. Neg. 11688.

Loreto: Mouth of Río Santiago, *Tessmann 4523*, type.—Río Acre: *Ule 9324*.

13. OGCODEIA Bureau

Acanthosphaera Warb. Verh. Bot. Ver. Brandenb. 48: 150. *pl. 2.* 1907.

Pistillate receptacles more or less "spiny" in appearance by the accrescence of the subulate bracteoles; staminate receptacles with broad, seriately arranged bracts. Branchlets usually conspicuously provided with large, stiff stipules.—See Mildbraed, Notizbl. Bot. Gart. Berlin 10: 186. 1927; 11: 418. 1932, for a redefinition of the genus and its relationship with *Naucleopsis macrophylla* Miq., which apparently is unknown from Peru unless *O. Ulei* is a synonym (cf. Ducke, Arch. Inst. Biol. Veg. 2: 30. 1935). It is not clear to me that *Ogcodeia* is soundly separated; there is too much stress placed perhaps on presence or absence of perianth in one sort of flower and in bract development, especially when the bracteoles here as elsewhere, or the perianth segments when completely divided, may separate the flowers indiscriminately, thus morphologically serving the same purpose.—Besides the following there is *O. amara*

Ducke with leaves 5–10 cm. broad, the lateral nerves 15–18, and the bractlets of the mature receptacle aculeate-linear and 3–5 cm. long. It has a very little latex, and is used as a remedy for fevers under the names "quina" or "bálsamo," terms applied also to *Quassia amara* and *Myroxylon peruiferum* respectively (Ducke). Another Amazonian species has been indicated, *O. caloneura* (Huber) Macbr. It suggests *O. Tessmannii*, but the young parts and the bracts are puberulent-tomentulose.

Leaves mostly 3–6.5 cm. wide, with 15–20 lateral nerves.

Petioles rarely 1 cm. long; nerves rather inconspicuous beneath.

Leaves cuneate at the base, 3–4 cm. wide. . .*O. ternstroemiiflora.*

Leaves rounded at the base, 5–6 cm. wide. . . . . .*O. Tamamuri.*

Petioles often longer; nerves conspicuous beneath.

Leaves rarely 5 cm. wide, the acumen often 2 cm. long.

O. Tessmannii.

Leaves often 6–7 cm. wide, the acumen rarely 1.5 cm. long.

O. glabra.

Leaves mostly 8–12 cm. wide, the lateral nerves 25–30. . . .*O. Ulei.*

Ogcodeia glabra (Spruce) Mildbr. Notizbl. Bot. Gart. Berlin 11: 418. 1932. *Naucleopsis glabra* Spruce in herb.

Branchlets and leaves glabrous, the latter coriaceous, with a very prominent costa beneath; lateral nerves 12–14, the veins reticulate; petioles 2–2.5 cm. long; leaf blades 4–6 cm. wide, about 15 cm. long, the acumen 1 cm. long; pistillate inflorescence 2 cm. wide; bracts recurving, oblong-lanceolate, acutish, very minutely puberulent, nearly 1.5 cm. long, or the innermost longer; perianth segments puberulent, linear-clavate, 5 mm. long; style 2 mm. long, the branches twice as long.—Description of pistillate inflorescence from the following collection, from a tree of 6 meters with brownish yellow flowers. Neg. 11649.

Loreto: Mishuyacu near Iquitos, 100 meters, in forest, *Klug 257*. Amazonian Brazil.

Ogcodeia Tamamuri Macbr. Field Mus. Bot. 11: 64. 1931.

Similar to *O. ternstroemiiflora*, but the leaves often 16–17 cm. long and 5–6 cm. wide, and the staminate receptacles geminate.—*O. caloneura* (Huber) Macbr. Field Mus. Bot. 11: 17. 1931, if sought here, is distinguishable by its rusty-tomentulose branchlets.

Loreto: Timbuchi on the Río Nanay, in forest, *Williams 992*, type. "Tamamuri."

Ogcodeia ternstroemiiflora Mildbr. Notizbl. Bot. Gart. Berlin 10: 188. 1927.

Youngest branchlets minutely puberulent; leaves oblongish, cuneate at the base, with an acumen 1–1.5 cm. long, with this mostly 12–13 cm. long and 3–4 cm. wide, drying pale brown beneath, densely but not conspicuously reticulate-veined; staminate receptacles axillary, to 4-fasciculate, on peduncles 5 mm. long, the spiraled bracts about 9, puberulent, oval to orbicular, 5 mm. long; bractlets 1–1.5 mm. long, 0.75 mm. broad, the blade plicate; filaments 1.5 mm. long, the anthers scarcely 1 mm. long.—A small tree, to 5 meters high, or larger, the trunk 20 cm. thick; inflorescences greenish or white or dirty white. Fruit eaten. In upland areas (Tessmann). Neg. 11650.

Loreto: Yarina-cocha, *Tessmann 5467, 3228.* Iquitos, *Tessmann 5358.* Río Marañón near mouth of Río Tigre, 115 meters, *Killip & Smith 27525.* San Antonio, 110 meters, in forest, *Killip & Smith 29305.* Mishuyacu, 100 meters, *Klug 1131.* Soledad, *Killip & Smith 29810.* "Lana." Amazonian Brazil.

Ogcodeia Tessmannii Mildbr. Notizbl. Bot. Gart. Berlin 10: 189. 1927; 11: 420. 1932.

Similar to *O. ternstroemiiflora* but quite glabrous; leaves thinner, with large, conspicuous nerves and veins beneath and glabrous bracts about 7 mm. long; pistillate heads nearly 2.5 cm. wide; bracts and bractlets very minutely puberulent, the larger inner bracts triangular-ovate, acuminate, about 1 cm. long, the perianth segments 4 mm. long, rigid-aculeate; style base 2 mm. long, the branches 6 mm. long. —A tree about 8 meters high, the trunk diameter 8 cm.; bracts yellowish. Neg. 11651.

Loreto: Mouth of Río Santiago, *Tessmann 4109,* type. Alto Río Itaya, *Williams 3511.* "Naccho-huasu."

Ogcodeia Ulei (Warb.) Macbr. Field Mus. Bot. 11: 16. 1931. *Acanthosphaera Ulei* Warb. Verh. Bot. Ver. Brandenb. 48: 150. *pl. 2.* 1907. *Naucleopsis Ulei* Ducke, Archiv. Jard. Bot. Rio Jan. 3: 38. 1922.

A small to tall tree with conspicuous, persistent stipules 1.5–2.5 cm. long, acuminate from a broad base, and heavy, oblong-elliptic, glabrous leaves on short, thick petioles 0.5–1.5 cm. long, the blades with many (25–30) parallel lateral nerves and reticulate-veined, especially beneath, several dm. long and 8–15 cm. wide; inflorescences axillary, sessile, the staminate 7 mm. long, 4 mm. broad;

stamens with their anthers and acute bractlets prominent, the former 3 mm., the latter 2 mm. long; pistillate inflorescences 5 mm. broad and long, the bractlets rounded at the tip, subasperous; style 2 mm. long, the branches longer; fruit globose, the aculeate bractlets 3.5 cm. broad, 3 cm. long, the bractlets themselves 8 mm. long and 2 wide.—Mature fruit pale yellow, sweet, edible (Ducke). The Killip and Smith numbers were determined by Smith as *N. macrophylla*, "probably identical with *N. Ulei*, the specific status of which is doubtful."

Loreto: Iquitos, *Ule 6257; (Ducke)*. Yurimaguas, 200 meters, *Williams 5194; Killip & Smith 28179, 28244*. San Antonio, 110 meters, *Killip & Smith 29300*. Amazonian Brazil.

14. **PEREBEA** Aubl.

Trees with usually thick leaves and unisexual, flattish to subglobose, many-flowered receptacles, the pistillate conspicuously pedunculate. Staminate perianth 4-parted, the pistillate 4-toothed. Ovary semi-inferior or completely free. Style very short, bidentate. —The rubber trees, *Castilla*, to which one of the following species has been referred, are very similar but the style is typically longer and the stamens are mixed with scales. Filiform stigmas and elongate bracts, the inner exceeding the perianth, are characters that serve to distinguish *Noyera*. *Olmedioperebea* Ducke, to be expected, differs in having only 1–4 pistillate flowers, these coalescent; the staminate perianths, too, are very short. In all these characters, other related plants considered, one may see degrees of development rather than fundamental distinctions. *Olmedia calophylla* P. & E., which probably will be found, may well belong to *Perebea* (*P. calophylla* Benth. & Hook.). It has heavy, callous-margined leaves, obviously scabrous beneath. *P. guianensis* Aubl. has already been found on the upper Amazon; its nearly glabrous, very large, and thin leaves are somewhat serrate and its ovary is completely superior (Ducke).

Leaves distinctly pseudopeltate ..... *P. pseudopeltata.*

Leaves acute at base or merely subcordate.

Leaves 20 cm. long or longer.

Pubescence neither scabrous nor stellate; leaves subcordate or emarginate at the base.

Leaves oblique at the base; stigmas lingulate. *P. Tessmannii.*

Leaves not oblique; stigmas cushion-shaped..... *P. australis.*

Pubescence of the leaves beneath scabrous or stellate-puberulent; leaves rounded to an acute base.

Leaves scabrous beneath ..... *P. Chimiqua.*

Leaves stellate-puberulent beneath ..... *P. Standleyi.*

Leaves 10 cm. long or shorter ..... *P. elegans.*

Perebea australis (Hemsl.) Macbr. Field Mus. Bot. 11: 17. 1931. *Castilla australis* Hemsl. in Hook. Icon. IV. 7: *pl. 2676.* 1901.

Young branchlets and leaves silky-tomentose or the latter glabrous above and hirsute beneath mostly on the costa and lateral nerves; petioles 1 cm. long; blades coriaceous, oblong-lanceolate, 30–40 cm. long and 10–20 cm. wide, slightly emarginate at the base, abruptly acuminate; primary nerves 17–19, joined before the undulate margin, prominent only beneath; pistillate receptacles axillary, solitary, on stipes 2–2.5 cm. long; bracts in several series, acuminate, free or nearly so; perianth free(?), lobed, pubescent; style short, thick, hairy, the stigmas cushion-like.—Pittier, Contr. U. S. Nat. Herb. 13: 258–260. 1910, cites this species as the only *Castilla* with cushion-shaped stigmas. The species, as apparently well illustrated, seems to be a typical *Perebea.* Probably the well known name *Castilla,* later than *Perebea,* should be conserved to include the latter group and several other segregates, as remarked elsewhere. "Common in woods," according to the collector, at 1,300–1,700 meters, in January, 1866, but apparently never collected since and the staminate flowers unknown.

Cuzco(?): Moro Zungo (*Pearce*).—Junín: Near La Merced, 800–1,300 meters, *Killip & Smith 23877;* a tree of 15–20 meters, the trunk 45 cm. in diameter.

Perebea Chimiqua Macbr. Field Mus. Bot. 11: 63. 1931.

Leaves distinctly although finely scabrous-puberulent beneath, shortly caudate-acuminate, not at all cordate at the base, to 25 cm. long and 12 cm. wide, often less than half as large, on petioles 1 cm. long, thinnish; staminate receptacles 2–4 in the axils, short-peduncu-late, 5 mm. wide; bracts broadly ovate, 1.5 mm. wide, scarcely acute, strigose; perianth segments 4, little thickened at the apex; filaments very short; anthers subrotund.—Near *P. guianensis* Aubl., with leaves slightly cordate and nerves more or less hirsute.

Loreto: San Antonio, Alto Río Itaya, 145 meters, *Williams 3412,* type. "Chimiqua."

Perebea elegans Macbr. Field Mus. Bot. 11: 63. 1931.

A tree of 20 meters; young branchlets rusty-tomentulose; petioles 5–7 mm. long; leaves oblong-elliptic, slightly oblique at the acute base, short-acuminate, to 5 cm. wide, slightly puberulent on the reticulate veins and nerves beneath, the latter about 12; staminate receptacles in 3's (mostly), globose, 7 mm. thick, the peduncles nearly 5 mm. long; bracts scale-like; perianth segments 4 mm. long, strongly fleshy-cucullate at the apex, puberulent; filaments 4, thick, 2 exserted. —Perhaps nearest *P. laurifolia.*

Loreto: Mishuyacu, near Iquitos, 100 meters, *Klug 603*, type.

Perebea pseudopeltata Mildbr. Notizbl. Bot. Gart. Berlin 10: 184. 1927.

A tree, readily known by its foliage, the lobes of its deeply cordate leaves so closely investing the petiole apex that is sunken in the leaf base that the leaves appear to be peltate; they are oval-oblong, abruptly acuminate, about 50 cm. long and nearly 25 cm. wide, glabrous above, but appressed setose-pilose and puberulent on the obvious (20–23) lateral nerves and the finely reticulate venation beneath; stipules densely long-silky-pubescent; staminate receptacles 6–12-fasciculate on short branchlets, 1.5–2.5 cm. wide (young), the many marginal bracts in 2–3 irregular series, about 2.5 mm. long, the outer broader, fewer; perianth segments 4, widened and thickened below the tip.—Greenish yellow heads unpleasantly scented. A tree about 15 meters high, branching at 8 meters, the trunk 22 cm. in diameter. In upland woods. Neg. 11680.

Loreto: Mouth of Río Santiago, in upland forest, *Tessmann 4552*, type.

Perebea Standleyi Macbr., sp. nov.

Arbor; ramulis junioribus pedunculisque fulvo-stellato-tomentulosis; petiolis circa 6 mm. longis; foliis circa 30 cm. longis 12 cm. latis, membranaceis, basi rotundato-acutis, apice ignoto, ubique costa subtus excepta minute parceque stellato-puberulenta glabris, nervis lateralibus circa 18 solum subtus cum venis reticulatis prominulis; pedunculis circa 1 cm. longis; receptaculis 2 cm. crassis; fructibus angulatis obovoideis 1 cm. longis, ad apicem exceptis glabris, apice dense fulvo-stellato-tomentosis 7 mm. crassis.

A tree, the branchlet tips and peduncles rusty stellate-tomentulose; petioles 6 mm. long; leaves nearly 30 cm. long, 12 cm. wide, rounded to the acute base, the apex unknown, membranous, glabrous

except the minutely and sparsely stellate-puberulent costa beneath; lateral nerves about 18, with the reticulate veins prominent only beneath; peduncles 1 cm. long; fruiting receptacles 2 cm. thick, the angled fruits obovoid, 1 cm. long, glabrous except at the 7 mm. broad apex which is velvety rusty-tomentose.

Loreto: Yurimaguas, *Killip & Smith 28340* (Herb. Field Mus. No. 615,971, type).

Perebea Tessmannii Mildbr. Notizbl. Bot. Gart. Berlin 10: 185. 1927.

A tree 25 meters tall, with few branches, the young ones chestnut-colored and appressed-setulose; petioles to 12 mm. long; leaf blades ovate or elliptic-ovate, 25–30 cm. long and usually 12–15 cm. wide, more or less markedly oblique at the base, with an acute acumen as much as 2.5 cm. long, at first somewhat appressed-setulose above, beneath laxly sericeous-setulose on the costa and conspicuous (about 20) lateral nerves and veins; pistillate receptacle 1.5 cm. in diameter, the squamate bracts passing from rotund-ovate to narrowly triangular; perianth urceolate, 5 mm. long, pubescent, the lingulate stigma 1.5 mm. long, glabrous; staminate receptacles 3–5 in the axils, on peduncles 1.5 cm. long, somewhat hispid-pilose, 8–12 mm. broad, the bracts similar but fewer than in the pistillate; perianth segments rounded at the tip, tomentose, 2 of them broader; filaments rigid, connate at the base.—Var. *Ulei* Mildbr. (Río Acre) has smaller leaves with 15–16 nerves, the midrib pubescence beneath spreading. Trunk diameter to 31 cm.; branching at 12 meters. In upland forests. The Klug specimen has leaves to 40 cm. long, distinctly cordate at the base, the basal lobes overlapping, and suggests *P. pseudopeltata*. Neg. 11681.

San Martín: Pongo de Cainarachi, *Klug 2719* (det. Standley).—Loreto: Mouth of Río Santiago, *Tessmann 4174, 4601*.—Río Acre: *Ule 9325*.

15. CASTILLA Cervantes

Reference: Pittier, Contr. U. S. Nat. Herb. 13: 247–279. 1910.

Very similar to *Perebea*, but the single Peruvian species distinguished by the short, harsh pubescence on the upper surface of at least all but the oldest leaves. Ducke has remarked that the foliage of *P. guianensis*, as yet not known from Peru, is, however, similar to that of *C. Ulei*, and this similarity probably substantiates the suggestion that the genera are not natural (see remarks under *Pere-*

bea). In Central America the genus is a source of rubber. The name has been written *Castilloa*.

Castilla Ulei Warb. Bot. Jahrb. 35: 674. 1905.

Branchlets more or less rusty-hispid, glabrous in age; petioles 5 mm. long; leaves oblong-elliptic, short-acuminate or apiculate, 10–25 cm. long, 4–6 cm. wide, appressed-tomentose beneath; fruit solitary, axillary, subglobose, 2 cm. long, 2–2.5 cm. wide, the 3–5 seeds 12 mm. long, 6 mm. wide.—Illustrated, loc. cit.; Contr. U. S. Nat. Herb. 13: *pl. 22*.

Loreto: Pebas, *Williams 1802*.—Río Acre: *Ule 9318*. Brazil. "Caucho negro," "caucho."

16. NOYERA Trécul

A tree with the foliage of the Peruvian species of *Castilla*, but the interior bracts of both sorts of receptacles much longer than the outer and the staminate receptacles long-peduncled. Style branches (stigmas) long and slender.

Noyera mollis (Poepp.) Ducke, Archiv. Jard. Bot. Rio Jan. 3: 37. 1922. *Olmedia mollis* Poepp. Nov. Gen. & Sp. 2: 31. *pl. 144*. 1838.

Branchlets hirsute; leaves subsessile, oblong, acute, about 20 cm. long, 7 cm. wide, pustulate-setulose above, hirsute beneath; staminate receptacles several, fasciculate, with linear interior bracts; perianth 3–4-parted; stamens 2–4; pistillate receptacles sessile, 8–12-flowered; ovary semi-inferior.—A tree as much as 20 meters high, with an abundant, grayish yellow latex, the pale yellow wood worthless; mature fruits greenish yellow, the drupes separating easily (Ducke). At Obidos called "muiratinga da terra firma" (Ducke). Neg. 11687.

Loreto: *Tessmann 5465* (det. Mildbraed). Amazonian Brazil. "Caucho-rana."

17. PSEUDOLMEDIA Trécul

Small to large trees with smooth, puberulent, or sparsely hirtellous leaves and small, unisexual, bracteate receptacles, the pistillate 1 (–3)-flowered, and the bracts of these all tiny, those of the staminate often elongate, at least the interior. Ovary adherent to the perianth.—*Olmedioperebea* Ducke is similar to this and *Olmedia* but the pistillate flowers if more than 1 (1–4) are concrescent, the stigmas are short and thick, and bracteoles are lacking in both sorts of receptacles. It is nearly *Perebea* except for its few-flowered pistillate receptacles, and its existence suggests that *Perebea* must naturally

include all the *Olmedieae*, including *Castilla*, which well-known name ought to be conserved for the genus, sens. lat. The latter, as well defined by Pittier, illustrates the great variation in characters elsewhere accepted as of generic import. There is no sound distinction between these small groups. The recently redefined *Ogcodeia* may have some merit as a segregate because of its exaggerated bracteole development and divided perianths, but these are relative developments, as is illustrated in the case of the former by *Perebea acanthogyne* Ducke.

Petioles 2–5 mm. long; leaf areoles shallow.

Branchlets and leaves glabrous, the latter mostly 2–4 cm. wide.

Leaves thin, 2–3 cm. wide..... *P. laevigata.*

Leaves thick, mostly 4–4.5 cm. wide..... *P. Mildbraedii.*

Branchlets and leaves (5–10 cm. wide) somewhat pubescent, not distinctly scabrous.

Pubescence of appressed puberulence..... *P. macrophylla.*

Pubescence sparse, hirtellous, evanescent..... *P. laevis.*

Branchlets and leaves distinctly scabrous..... *P. scabra.*

Petioles 8–10 mm. long; leaf areoles very deep..... *P. multinervis.*

Pseudolmedia laevigata Trécul, Ann. Sci. Nat. III. 8: 131. 1847.

Similar to *P. laevis* but glabrous and with thinnish, much smaller, oblong-lanceolate, obtusely acuminate leaves with an acute, slightly oblique base, 5–9 cm. long; lateral nerves 15–18, not prominent; staminate receptacles sessile, 2–several, the roundish bracts appressed-puberulent, with scarious, ciliate-subfimbriate margins.—*P. Huberi* Macbr. Field Mus. Bot. 11: 16. 1931 (*P. obliqua* [Huber] Ducke, not [Karst.] Benth. & Hook.) has broader leaves, very oblique at the rounded or truncate base.

Peru: (*Pavón?*), Herb. Webb (type).—Loreto: Iquitos, *Ducke 7513*(?).—Without locality: *Weberbauer 6965.*

Pseudolmedia laevis (R. & P.) Macbr. Field Mus. Bot. 11: 16. 1931. *Olmedia laevis* R. & P. Syst. 258. 1798.

Young branchlets subcompressed, hirsute with spreading hairs, the leaves beneath on the conspicuous lateral nerves (15–18) sparsely so but subappressed or finally glabrous; leaves subcordate or rotund at the base, gradually acuminate, rather thick, about 15 cm. long and half as wide; pistillate receptacles sessile in the leaf axils, the bract-

lets strigose, the perianth densely soft-pubescent.—Perhaps only a single variable species is concerned with this, together with *P. laevigata* and *P. macrophylla*. *P. ferruginea* (P. & E.) Trécul, to be expected, is similar to *P. laevis*, but the branchlets are hirsute and the leaves are very oblique at the base. The trunk of *P. laevis* on incision yields abundantly a white latex which on exposure to the air condenses into an elastic resin, reddish chestnut in color (Ruiz & Pavón). Neg. 11670.

Junín: La Merced, *Weberbauer 1899*.—Huánuco: Posuso region, *Ruiz & Pavón*.—San Martín: Juanjui, 400 meters, in forest, *Klug 3819;* a tree of 15 meters.

Pseudolmedia macrophylla Trécul, Ann. Sci. Nat. III. 8: 132. 1847.

A tree or shrub with densely appressed-pubescent branchlets (eventually glabrate) prominently marked by the stipular scars; leaves oblong-elliptic, subrotund at the base, rather abruptly acuminate, with a linear, obtuse tip, appressed-pubescent beneath on the nerves, 15–20 cm. long, 5–10 cm. wide, the lateral nerves 17–18; staminate receptacles geminate, 7–8 mm. broad, the roundish bracts densely yellowish appressed-pubescent. Neg. 18815.

Peru: (*Pavón*).

Pseudolmedia Mildbraedii Macbr. Field Mus. Bot. 11: 61. 1931.

A tree about 15 meters high, the staminate receptacles star-like, the light yellow stamens and several narrow bracts spreading as points; leaves 8–9 cm. long, the 15 lateral nerves conspicuous, as also the reticulate venation above, not at all oblique at the acute base, obtusely and broadly caudate at the apex or shortly obtuse-acuminate; bracts thin but not scarious and obscurely ciliate on the margins.

Loreto: Mishuyacu near Iquitos, 100 meters, in forest, *Klug 633*, type.

Pseudolmedia multinervis Mildbr. Notizbl. Bot. Gart. Berlin 10: 189. 1927.

A tree sometimes 60 meters high, with a trunk diameter of 1 meter, the densely leafy branchlets closely and persistently hirsute; leaves ovate-oblong-lanceolate, mostly obliquely rounded at the base, more or less gradually acuminate, usually 9–14 cm. long, 3–5 cm. wide, above glabrous except on the sunken costa, which is strongly

hirsute beneath, the 17–22 conspicuous nerves less so, the areoles between the numerous veins deeply granulate-rugulose; staminate receptacles 1–1.5 cm. wide, the principal bracts broadly triangular, sericeous-pubescent, as also the tips of the (2–3 mm. long) spatulate bractlets; anthers 1.5–2 mm. long, apiculate, glabrous.—In upland forest. Fruit eaten. Neg. 11671.

Loreto: Mouth of Río Santiago, *Tessmann 4697*. Soledad, 110 meters, *Killip & Smith 29809*. Fortaleza, Lower Río Huallaga, *Williams 4379*.—Río Acre: *Ule 9322*. "Chimicua," "itaúba amarilla."

Pseudolmedia scabra Macbr. Field Mus. Bot. 11: 62. 1931.

A tree of 4 meters, readily recognizable by the dense and fine but "sticky," scabrous puberulence that covers the leaves on both sides; leaves oblong-elliptic, equal and acute at the base, obtuse or nearly so at the apex, finally 11 cm. long, 4–5 cm. wide, paler beneath, the 9 lateral nerves and veins prominent; staminate receptacles axillary, 2–3, on peduncles 5–7 mm. long, globose, 5 mm. thick; bractlets little thickened at the apex, 1 mm. long; filaments slender, nearly 1.5 mm. long, the anthers nearly 1 mm. long.

Loreto: Mishuyacu near Iquitos, 100 meters, in forest, *Klug 384*, type.

18. OLMEDIA R. & P.

Very much like *Pseudolmedia* in aspect, but the staminate flowers ebracteolate and the ovary free.—*O. calophylla* P. & E. (possibly a *Perebea*) is well marked by its large, thick leaves, lustrous above, opaque and scabrous beneath, and with a definite cartilaginous margin.

Leaves glabrous, 1–2.5 cm. wide.....*O. angustifolia*.
Leaves scabrous, at least beneath, mostly wider.
Leaves somewhat scabrous-pubescent, even above.....*O. aspera*.
Leaves smooth above.....*O. Poeppigiana*.

Olmedia angustifolia P. & E. Nov. Gen. & Sp. 2: 30. *pl. 143*. 1838.

A small tree with slender, flexuous branchlets, the youngest strigose-puberulent, and with numerous thin, oblong, entire (or with 1 or 2 remote teeth toward the tip) leaves mostly 8–10 cm. long, acute at the base, caudately acuminate, the tip often 1.5 cm. long; receptacles with ovate-deltoid, sparsely strigillose bracts and many silky-pubescent flowers.

Loreto: Yurimaguas, *Poeppig 2270*, type.

Olmedia aspera R. & P. Syst. 257. 1798.

Very well marked by the extremely scabrous leaves and, to a less extent, the younger branchlets; leaves thinnish, obscurely and remotely toothed, often 15 cm. long and 4–6 cm. wide or larger; staminate receptacles sessile or nearly so.—A shrub or tree of 3–10 meters (Ule). Incised, the trunk emits copiously a white latex similar to that of *Pseudolmedia laevis* (Ruiz & Pavón). A large tree; the inner bark, beaten and washed, used for making mats in which the Indians carry their baggage on journeys, to serve them in place of beds (Huber). Neg. 11674.

Huánuco: Posuso and Chinchao, *Ruiz & Pavón.* Cochero, *Poeppig 1267.*—Junín: La Merced, 600 meters, *5269; Weberbauer 1916, 1871; Killip & Smith 23464, 23816.* Chanchamayo Valley, 1,500 meters, *Schunke 273, 272.* Colonia Perené, 680 meters, *Killip & Smith 25057.* Río Paucartambo Valley, 700 meters, in forest, *Killip & Smith 25369.* Colonia Perené, *Weberbauer 91.*—San Martín: Río Chipurana, *Huber 1548.* San Roque, 1,400 meters, *Williams 7195, 7082.* Tarapoto, 750 meters, *Williams 6022, 6019, 6544.* Juanjui, 400 meters, in forest, *Klug 3787.*—Without locality: *Weberbauer 7059.* Ecuador to Bolivia. "Llanchama," "minshi-pata."

Olmedia Poeppigiana Klotzsch, Linnaea 20: 525. 1847.

Probably only a variety or form of the above.—Of greater interest is the related gigantic tree, *O. maxima* Ducke, Archiv. Jard. Bot. Rio Jan. 3: 32. *pl. 3.* 1922, "muiratinga" of the Amazon, with a yellowish white wood, said to be valueless. Its rather abruptly acuminate leaves are minutely pilose or glabrate beneath and the staminate receptacles are pedunculate, with a few small, tomentulose bracts at the base. Neg. 11677.

Huánuco: Cochero, *Poeppig 1267.*—Loreto: Puerto Meléndez, *Tessmann 3914.*

19. HELICOSTYLIS Trécul

A tree similar to *Perebea,* but the stigmas long and slender and somewhat contorted. The typical and Peruvian species is distinguishable, however, by the characteristic reddish brown tomentum of the receptacles and growing parts, which is at least less markedly present in other Moraceous genera.

Helicostylis tomentosa (P. & E.) Macbr. Field Mus. Bot. 11: 16. 1931. *Olmedia tomentosa* P. & E. Nov. Gen. & Sp. 2: 32. *pl. 145.* 1838. *H. Poeppigiana* Trécul, Ann. Sci. Nat. III. 8: 134. 1847.

Typically a large tree, the petioles, leaves beneath (on the prominent nerves and veins), peduncles, and receptacles reddish velvety-pubescent; leaf blades oblong, acute at the base, acuminate, glabrous above except on the 11–16 nerves, 8–18 cm. long, 4–6 cm. broad; petioles 6–10 mm. long; staminate receptacles 3–10-fasciculate, the peduncles 5–13 mm. long; pistillate receptacles solitary, globose.—The Rivero plant is a variety with puberulent branchlets, elliptic-oblong leaves subrotund at the base, abruptly acuminate, glabrous above and shortly hirtellous or glabrate beneath, 12–25 cm. long, 5.5–9 cm. broad, on petioles 1.5 cm. long. The specimen may be rather a *Perebea*.

Loreto: Florida, Río Putumayo, 180 meters, in forest, a tree of 5 meters, *Klug 2295*(?).—Without locality: (*Rivero*). Brazil; British Guiana.

20. TRYMATOCOCCUS P. & E.

Reference: Lanjouw, Recueil Trav. Bot. Néerl. 32: 262–272. 1935.

Generally a small tree with oblongish, acuminate, undulate, very shortly petioled leaves and solitary, short-pediceled, subglobose, nodding receptacles. Pistillate flowers deeply immersed, the perianth wanting, the staminate 3-lobed, with 3 stamens.—Ducke has recorded an abundant latex, which Poeppig did not find, perhaps testing only young, fertile branches.

Trymatococcus amazonicus P. & E. Nov. Gen. & Sp. 2: 30. *pl. 142*. 1838.

Leaves rigid, glabrous, or slightly lepidote above, to 15 cm. long and 7 cm. broad, or often smaller, conspicuously yellowish net-veined beneath; stamens included, the filaments coalescent below; style exserted, bifid; fruit hard, 1-seeded, about 2 cm. thick.—*T. turbinatus* (Baill.) Ducke, Archiv. Jard. Bot. Rio Jan. 3: 73. 1922, has tomentose branchlets and petioles and much larger (2.5–3 cm. across in fruit) receptacles that are velvety-pubescent. The thickly veined, obovate-elliptic leaves of *T. paraensis* Ducke, Archiv. Jard. Bot. Rio Jan. 3: 22. 1922, are mostly smaller, being only 4–5 cm. long and 3 cm. wide, and the latex is greenish.

San Martín: Tarapoto, *Spruce 3895*. Pongo de Cainarachi, 230 meters, *Klug 2718*.—Loreto: Iquitos, *Tessmann 5350, 5354* (det. Mildbraed); (*Ducke 7537*); *Killip & Smith 26997*. Yurimaguas, *Poeppig 2630*, type; at 135 meters, *Killip & Smith 29052, 29114;* in forest, *Williams 4525, 3875*. Punchana, 120 meters, in forest,

Williams 3767. Pebas, *Williams 1882.* San Juan, *Williams 3735.* La Victoria, edge of forest, *Williams 2965.* Brazil.

49. URTICACEAE. Nettle Family

By E. P. Killip

References: Weddell, Ann. Sci. Nat. III. 18: 197–232. 1852; IV. 1: 173–212. 1854; Arch. Mus. Paris 9. 1856–1857; DC. Prodr. 16, pt. 1: 32–235. 1869; Blume, Mus. Bot. Lugd. Bat. 2: 43–170. 1852–1856; Killip, "Notes on Peruvian Urticaceae of the Marshall Field Exploration," Journ. Wash. Acad. Sci. 15: 48–56. 1925.

Monoecious or dioecious herbs, shrubs, or trees, sometimes armed with stinging hairs and often bearing cystoliths; leaves simple, alternate, with those of the adjacent nodes often unequal, or opposite, with those of a pair often unequal, entire, toothed, or rarely lobed, stipulate; flowers small, greenish or greenish white, in unisexual or androgynous clusters, the perianth 2–5-lobed or parted, or sometimes wanting; fruit an achene.

Leaves opposite, those of a pair often unequal; plants mostly herbaceous.

Plants armed with stinging hairs; perianth of pistillate flowers 4-parted.....1. *Urtica.*

Plants without stinging hairs; perianth of pistillate flowers 3-parted, or tubular and 2–4-dentate.

Stigma short-penicillate; inflorescence paniculate, cymose, or capituliform; plants usually herbaceous.....2. *Pilea.*

Stigma filiform; flowers in sessile clusters in the leaf axils or in spikes; plants woody.....3. *Boehmeria.*

Leaves alternate.

Perianth of pistillate flowers none.

Flowers in axillary glomerules.....4. *Phenax.*

Flowers in long, slender spikes .....5. *Myriocarpa.*

Perianth of pistillate flowers present.

Plants woody.

Stigma sessile, penicillate; plants usually armed with stinging hairs.....6. *Urera.*

Stigma filiform; plants without stinging hairs.

Pistillate perianth strongly nerved; achenes crustaceous, light brown to white; leaves entire (toothed in one Peruvian species), those of the adjacent nodes subequal.

7. *Pouzolzia.*

Pistillate perianth nerveless; leaves toothed, those of the adjacent nodes often very unequal.....3. *Boehmeria.*

Plants herbaceous.

Leaves toothed; plants armed with stinging hairs; inflorescence paniculate.....8. *Fleurya.*

Leaves entire; plants unarmed; inflorescence glomerulate. 9. *Parietaria.*

1. URTICA L. Nettle

Annual or perennial herbs armed with stinging hairs; leaves petiolate, toothed or incised; plants monoecious or dioecious, the flowers in androgynous or unisexual clusters, axillary and subsessile, or forming elongate spikes or panicles, 4-parted.

Leaves flabellate-incised, the segments lobed..... *U. flabellata.*

Leaves ovate to ovate-lanceolate, or cordate.

Inflorescences unisexual; leaves rufo-hirsutulous beneath. *U. Macbridei.*

Inflorescences androgynous; leaves glabrous, or pilose or pilosulous with pale hairs.

Achenes not more than 1 mm. long, very slightly flattened; leaves thick, usually rugose-bullate..... *U. echinata.*

Achenes 1.2–2 mm. long, strongly flattened; leaves thin, flat.

Leaves incised-dentate; flowers in glomerules; plants annual. *U. urens.*

Leaves coarsely dentate or serrate; flowers in glomerules or elongate spikes; plants perennial..... *U. magellanica.*

Urtica echinata Benth. Pl. Hartw. 252. 1846. *U. andicola* Wedd. Ann. Sci. Nat. III. 18: 198. 1852.

An annual herb up to 40 cm. high, usually densely covered throughout with stinging hairs; stem pilosulous; leaves ovate or ovate-orbicular, 0.5–3 cm. long, coarsely dentate, acute, usually rugose-bullate and pubescent beneath; flowers in sessile, androgynous clusters shorter than the petioles; achenes 0.8–1 mm. long, apiculate, very slightly compressed.

Huánuco: Baños, *Wilkes Expedition.*—Junín: At 4,000 meters, *Mackenzie* in 1924.—Arequipa: Nevado de Chachani, 4,200 meters, *Pennell 13289.*—Tacna: Volcán Tacora, 4,000–4,500 meters, *Weddell 4440* (type of *U. andicola*); *Werdermann 1147.*—Cuzco: Cordilleras del Pachatusán, 4,400 meters, *Herrera 2578.* Also in Ecuador and Bolivia.

Urtica flabellata HBK. Nov. Gen. & Sp. 2: 40. 1817.

An annual, branched from the base, sparingly bristly on the stem, densely so on the foliage; leaves thick, flabellate-incised, with the segments subtrilobate, rugose-bullate; panicles androgynous, densely flowered, shorter than the petioles; achenes 1.5–2 mm. long, acute, strongly flattened.

Huánuco: Pampas de Bombón, *Ruiz & Pavón.*—Junín: *Raimondi 1186.* Huancayo, 3,400 meters, *Killip & Smith 22118.*—Cuzco: Paucartambo Valley, 3,600 meters, *Herrera 2321.*—Puno: San Antonio, *Lechler 1802.* Sandía, *Weberbauer 969.*—Without locality: *Ruiz & Pavón; Gay 979.* Also in southern Colombia, Ecuador, and Bolivia.

Urtica Macbridei Killip, Journ. Wash. Acad. Sci. 15: 49. 1925.

An erect herb, about 1.5 meters high, armed with a few weak bristles; leaves sparse, cordate-ovate, 6–12 cm. long, 4–8 cm. wide, acuminate, crenate, densely hirsutulous on the nerves and veins beneath; plants monoecious, the flower spikes unisexual, the staminate spikes 12–15 cm. long, in the upper axils, the pistillate 3–3.5 cm. long, in the lower axils; achenes 1 mm. long.

Huánuco: Muña, 2,400 meters, *4271* (type).

Urtica magellanica Poir. in Lam. Encycl. Suppl. 4: 223. 1816.

A perennial herb, up to 80 cm. high, the stem glabrous or pubescent, sparingly or sometimes densely armed with bristles; leaves ovate or ovate-lanceolate, 2–7 cm. long, 1.5–5 cm. wide, acuminate, cordate or rounded at the base, coarsely serrate or dentate; flowers in androgynous glomerules or slender spikes, the staminate flowers about 2 mm. wide; achenes 1.2–1.5 mm. long, strongly compressed.

Cajamarca: Cutervo, *Raimondi 4101.* Tambillo, *Raimondi 4340, 4392, 7053.*—Lima: Río Blanco, 3,300 meters, *Killip & Smith 21629.*—Huánuco: Llata, 2,100 meters, *2268.*—Junín: La Oroya, *Rose 18699.*—Cuzco: Ollantaitambo, 3,000 meters, *Cook & Gilbert 636, 798, 1204.* Cuzco, *Herrera 533, 679.*—Puno: Puno, *Soukup 12.*—Dept. uncertain: San Damián, 2,400–3,000 meters, *Hrdlicka* in 1913. Without locality: *Gay 589, 2159.* Also in Bolivia, Chile, and Argentina. "Apiquisa," "celula quisa," "quisa," "mula-quisa," "yana-quisa."

These specimens show much variation in the length of the inflorescences, and perhaps more than a single species is represented. *U. ballotaefolia,* a common plant of Colombia, is similar to *U.*

magellanica, and some of the Peruvian material listed above has been referred to it. Other specimens have been cited in literature as *U. bracteata* Steud.

Urtica urens L. Sp. Pl. 984. 1753.

An erect or ascending annual, 15–50 cm. high, with a simple or few-branched stem; leaves crowded, oval, 2–5 cm. long, 0.6–3 cm. wide, rarely larger, rounded or acute at the ends, incised-dentate; panicles androgynous, subsessile, usually shorter than the petioles; achenes 1.5–2 mm. long.

Lima: Matucana, 2,400 meters, *174.* Surco, 1,500 meters, *Killip & Smith 21534.* Río Blanco, 3,000–3,500 meters, *Killip & Smith 21627, 21709.*—Junín: La Oroya, 3,650 meters, *974.* Tarma, 3,100 meters, *Killip & Smith 21781.*—Cuzco: Ollantaitambo, 3,000 meters, *Cook & Gilbert 778, 788, 1202.* Cuzco, *Herrera 305.*—Without locality: *Humboldt & Bonpland; Lechler 1803; Savatier; Gay 2285.* Introduced from Europe and widely distributed in the New World. "Quisa," "cohuiquisa," "ortiga menor."

2. PILEA Lindl.

Reference: Killip, Contr. U. S. Nat. Herb. 26: 367–394. 1936.

Annual or perennial, monoecious or dioecious, usually succulent herbs, sometimes suffrutescent; leaves opposite, entire or toothed, trinerved or triplinerved, occasionally penninerved, those of a pair sometimes unequal and dissimilar; flowers in clusters, rarely solitary, forming dense heads, cymes, panicles, or umbels, which are androgynous or unisexual; staminate flowers 4 (rarely 2–3)-parted, the pistillate normally 3-parted, the segments unequal, the stigma short-penicillate, sessile; achenes compressed.

Leaves all entire, usually less than 1 cm. long.

Leaves faintly 1-nerved.

Cymes sessile or subsessile; leaves, at least the larger one of a pair, obovate or oblong, cuneate.

Cystoliths not elevated, very faint on under surface of the leaves; plant suberect, up to 30 cm. high . . *P. microphylla.*

Cystoliths strongly elevated on both surfaces of the leaves; plant lax, the branches 50 cm. or more long . . *P. foliosa.*

Cymes pedunculate; leaves nearly globular, appearing orbicular when dry . . . . . *P. serpyllacea.*

Leaves trinerved.

Staminate flowers borne singly or in pairs; leaves cordiform; plant prostrate, much branched . . . . . *P. nerteroides.*

Staminate flowers in sessile, androgynous heads; plant erect, unbranched..... *P. nitida.*

Leaves (at least the larger one of a pair) toothed, sometimes subentire in *P. marginata.*

A. Leaves of a pair dissimilar or very unequal, the larger more than twice as long as the smaller.

Plants with densely pubescent branches and petioles; stipules more than 2 mm. long, subpersistent.

Leaves less than 7 mm. long, the cystoliths conspicuous. *P. pulegifolia.*

Leaves 1–3 cm. long, the cystoliths faint beneath. *P. ramosissima.*

Plants glabrous throughout.

Foliar cystoliths none..... *P. Weberbaueri.*

Foliar cystoliths present.

Larger leaves at a node not more than 4 mm. wide. *P. diversifolia.*

Larger leaves at a node more than 4 mm. wide.

Leaves appearing to be in fours at the nodes, owing to the presence of a short branchlet bearing a pair of leaves..... *P. nutans.*

Leaves otherwise.

Smaller leaf of a pair oblique, subentire; pistillate cymes sessile.

Larger leaves very oblique, more than 7 cm. long, fully 7 times longer than the smaller ones. *P. Bassleriana.*

Larger leaves symmetrical or nearly so, less than 7 cm. long, and proportionately shorter. *P. imparifolia.*

Smaller leaf symmetrical, toothed; pistillate cymes peduncled.

Cystoliths all punctiform..... *P. pichisana.*

Cystoliths linear or fusiform, occasionally punctiform ones intermingled.

Achenes longitudinally costate; larger leaves not more than 3.5 cm. long..... *P. costata.*

Achenes, as far as known, ecostate; larger leaves more than 3.5 cm. long.

Larger leaves more than 3.5 cm. wide, more than 5 times longer than the smaller ones. *P. Haenkei.*

Larger leaves not more than 3.5 cm. wide, less than 5 times longer than the smaller ones. *P. macrocystolithica.*

A. Leaves of a node similar and equal or, if unequal, the larger one not more than twice as long as the smaller.

B. Leaves averaging not more than 2 cm. long, usually massed at the end of the stem or branches; plants slender, usually prostrate or repent, the branches scarcely 10 cm. long.

Cymes androgynous; leaves coarsely crenate-dentate; stem unbranched..... *P. lamioides.*

Cymes usually unisexual; leaves serrulate or crenate-serrulate; stem usually branched.

Pistillate cymes sessile..... *P. Dombeyana.*

Pistillate cymes peduncled.

Stem long-repent and rooting at most of the nodes, the leaves rather evenly spaced out.. *P. nummularifolia.*

Stem repent only in the lower part, the leaves massed at the end of the stem and branches.

Stem densely pubescent..... *P. strigosa.*

Stem glabrous.

Cystoliths on lower surface of leaves linear or fusiform.

Leaves broadly ovate or suborbicular, toothed nearly to the base, the cystoliths inconspicuous..... *P. dauciodora.*

Leaves spatulate, rhombic, or suborbicular, toothed only in the upper half, the cystoliths conspicuous..... *P. Fendleri.*

Cystoliths on lower surface of leaves punctiform.

Achenes less than 1 mm. wide; leaves suborbicular or subreniform; plants monoecious.. *P. pusilla.*

Achenes more than 1 mm. wide; leaves ovate-lanceolate; plants apparently dioecious. *P. delicatula.*

B. Leaves averaging more than 2 cm. long; plants erect, more than 10 cm. high, usually leafy throughout.

C. Plants glabrous throughout.

Leaves coarsely and sharply serrate-dentate; inflorescence androgynous, sessile, much shorter than the petioles; plants annual, with a simple stem..... *P. hyalina.*

Leaves not coarsely and sharply serrate-dentate; inflorescence unisexual, pedunculate.

Staminate flowers in dense, globose heads, these solitary and long-peduncled or forming a once or twice branched cyme.

Plants dioecious; pistillate inflorescences diffuse, longer than the petioles..... *P. minutiflora.*

Plants monoecious; pistillate inflorescences compact, short-peduncled..... *P. Macbridei.*

Staminate flowers in cymes or panicles.

Cystoliths stellate, 3-rayed; leaves subentire or denticulate only toward the apex..... *P. marginata.*

Cystoliths simple; leaves definitely toothed.

Stem verrucose-roughened, woody; leaves averaging less than 3 cm. long..... *P. verrucosa.*

Stem smooth, usually herbaceous; leaves longer.

Leaves sessile or subsessile, sometimes clasping. *P. subamplexicaulis.*

Leaves distinctly petioled, never clasping.

Leaves ovate, triplinerved well above the base; inflorescences usually shorter than the petioles..... *P. punctata.*

Leaves trinerved or subtriplinerved near the base; inflorescences longer than the petioles.

Cystoliths of upper surface of leaves more than 0.5 mm. long, coarse, all fusiform; leaves thick-carnose..... *P. suffruticosa.*

Cystoliths of upper surface of leaves shorter and finer, linear, fusiform, or punctiform; leaves usually of a thinner texture.

Achenes minute, about 0.5 mm. long; leaves cordulate..... *P. citriodora.*

Achenes 1–1.5 mm. long; leaves narrowed at the base.

Stipules 3–10 mm. long, persistent. *P. Poeppigiana.*

Stipules less than 3 mm. long, soon deciduous..... *P. multiflora.*

C. Plants pubescent throughout, or at least with some indument on either the stem, leaves, or inflorescence.

Leaves of nearly equal size at all the nodes, the internodes subequal, the inflorescence not confined to the upper axils.

Plant annual, slender, with a pellucid stem; cymes androgynous; leaves sharply serrate-dentate. *P. hyalina.*

Plant perennial, with a coarse stem.

Stem succulent, essentially glabrous... *P. cushiensis.*

Stem ligneous or subligneous, densely rufo-hirsute.

Leaves short-acuminate; plants monoecious, the staminate flowers in a dense, globose head. *P. Pavonii.*

Leaves caudate-acuminate; plants dioecious, the staminate flowers in panicles..... *P. hirsuta.*

Leaves massed at the end of the stem and branches, or a few, much smaller, at the lower nodes; inflorescence mainly in the upper axils.

Staminate inflorescence borne at the rooting, leafless nodes, the perianth lobes about 2 mm. long. *P. submissa.*

Staminate inflorescence borne with the pistillate at the upper nodes, or the flowers mixed with the pistillate ones.

Cystoliths on upper surface of leaves all linear or fusiform, not elevated..... *P. pubescens.*

Cystoliths on upper surface of leaves punctiform or a few fusiform, elevated.

Leaves acuminate, densely hirsute above. *P. ceratocalyx.*

Leaves obtuse or subacute, glabrous above. *P. Spruceana.*

Pilea Bassleriana Killip, Contr. U. S. Nat. Herb. 26: 381. 1936.

A coarse, succulent, glabrous herb, up to 50 cm. high, terrestrial or on tree trunks; leaves of a node very unequal and dissimilar, the larger elliptic, ovate-elliptic, or elliptic-lanceolate, 8–15 cm. long, 2.5–7 cm. wide, caudate-acuminate, subsessile or short-petioled, coarsely crenate-serrate, the smaller ones orbicular-reniform, 5–15 mm. long, strongly oblique, sessile; plants monoecious or dioecious; staminate cymes borne along the naked rooting portion of the stem, pedunculate; pistillate cymes sessile in the axils of the leaves.

Loreto: Balsapuerto, 150–300 meters, *Killip & Smith 28429, 28467, 28471* (type); *Klug 2870.* Yurimaguas, *Killip & Smith 28993.* Pongo de Manseriche, *Killip, Smith & Dennis, 29145; Mexia 6355, 6360; Tessmann 4603.* Mouth of Río Pastaza (*Killip, Smith & Dennis, 29196*).

Pilea ceratocalyx Wedd. in DC. Prodr. 16, pt. 1: 148. 1869.

A low herb, densely grayish-hirsute throughout; leaves oblong or elliptic-ovate, 3–7 cm. long, 1–3 cm. wide, acuminate, narrowed at the base, sharply serrate, the cystoliths fusiform and punctiform; plants monoecious, the cymes apparently unisexual, the staminate compact, subsessile, the pistillate pedunculate, much longer than the adjacent petiole.

Huánuco: Cochero, *Poeppig 1032.*—Without locality: *Poeppig 3046* (type). These specimens are variously labeled "Peru" and "Brazil" in herbaria. The general relationship is with the Peruvian species.

Pilea citriodora Wedd. Ann. Sci. Nat. III. 18: 216. 1852. *Urtica limoniodora* Pavón ex Wedd. loc. cit., as synonym. *P. tarmensis* Killip, Journ. Wash. Acad. Sci. 15: 51. 1925.

An erect, glabrous herb up to 60 cm. high, the stem unbranched; leaves ovate-lanceolate, 6–14 cm. long, 2.5–6 cm. wide, obtuse or short-acuminate, cordulate, crenate-serrate, the cystoliths fusiform, linear, and punctiform; plants dioecious, both the staminate and pistillate flowers borne in diffuse, long-peduncled panicles.

Huánuco: Casapí, *Poeppig 1260.*—Junín: Huacapistana, Province of Tarma, 2,800 meters, *5822* (type of *P. tarmensis*); *Weberbauer 1776a.* Chanchamayo, *Raimondi 2398.*—Without locality: *Ruiz & Pavón* (type).

Pilea costata Killip, Contr. U. S. Nat. Herb. 26: 382. 1936.

A succulent, glabrous herb about 50 cm. high, branched toward the apex; leaves of a node unequal and dissimilar, crenate-serrate

nearly to the base, the cystoliths linear, the larger leaf lance-elliptic, 2.5–3.5 cm. long, 1.2–1.5 cm. wide, acuminate, the smaller one ovate, 1.5–2 cm. long, obtuse or subacute; plants dioecious, the pistillate cymes 3–4 mm. wide, sessile or nearly so; achenes longitudinally costate.

Junín: Eneñas, Pichis Trail, 1,700 meters, *Killip & Smith 25638* (type).

Pilea cushiensis Killip, sp. nov.

Herba dioica, caule foliato, infra glabro, ad apicem sparse rufo-hirsutulo; folia elliptico-ovata, crenato-serrata, triplinervia, supra glabra, subtus in costis sparse rufo-hirsutula, cystolithis linearibus, creberrimis; inflorescentiae paniculiformes, in axillis fere omnibus.

A succulent, perennial herb 1–1.5 meters high; stem sparsely rufo-hirsutulous toward the apex, otherwise glabrous; stipules ovate, about 3 mm. long, obtuse, soon deciduous; leaves of a node similar and subequal, elliptic-ovate, 7–15 cm. long, 3.5–6 cm. wide, acuminate, narrowed to a cordulate base, coarsely crenate-serrate, triplinerved (lateral nerves extending to the upper quarter of the blade), the cystoliths linear, dense, faint beneath, the petioles 2–12 cm. long, those at a node often very unequal; plants dioecious, the staminate inflorescences borne in most of the axils, paniculiform, about 3 cm. long (not fully developed), rufo-hirsutulous, the perianth segments suborbicular.

Huánuco: Cuschi, about 1,500 meters, June 19–23, 1923, on forest floor, *Macbride 4826* (type, Field Mus. No. 535,863).

In the key to the Andean species of *Pilea* (Contr. U. S. Nat. Herb. 26: 368–376. 1936) this species would be placed at the very end, being differentiated from the Colombian *P. Castronis* by the shape of the leaves and the cystolithic marking, and by having a more diffuse inflorescence.

Pilea dauciodora (R. & P.) Wedd. Ann. Sci. Nat. III. 18: 223. 1852. *Urtica dauciodora* R. & P. ex Wedd. loc. cit., as synonym. *P. uncidens* Wedd. op. cit. 224. *P. dauciodora* var. *uncidens* Wedd. in DC. Prodr. 16, pt. 1: 138. 1869.

A slender plant, often forming mats, glabrous throughout; leaves broadly ovate or orbicular-ovate, averaging 1.5 cm. long and 1 cm. wide, crenate-serrate, densely covered with linear and fusiform cystoliths; plants monoecious or dioecious, the clusters unisexual, though often both kinds borne at the same axils, rarely androgynous, slender-peduncled.

Huánuco: Muña, 2,000 meters, *4117*.—Junín: Huacapistana, 1,800–2,700 meters, *Killip & Smith 24160, 24408*. Acobamba, *Raimondi 2800*.—Ayacucho: Carrapa, 1,200 meters, *Killip & Smith 22439*.—Puno: Sandía, *Weberbauer 753*.—Without locality: "Andes," *Ruiz & Pavón* (type); *Spruce*. Also in Central America, Colombia, Venezuela, and Bolivia.

Pilea delicatula Killip, Journ. Wash. Acad. Sci. 15: 51. 1925.

A slender, glabrous herb, up to 10 cm. high; leaves ovate-lanceolate, 1–1.5 cm. long, acute, sharply mucronate-serrate, the cystoliths of the upper surface linear, faint, those of the lower surface punctiform; plants apparently dioecious; pistillate flowers in small, globose, short-peduncled cymes.

Huánuco: Tambo de Vaca, 4,000 meters, *4400* (type).

Pilea diversifolia Wedd. Ann. Sci. Nat. III. 18: 212. 1852.

A lax, much branched, glabrous herb, the stem up to 1.5 meters long; larger leaves of a node narrowly cuneate-oblong, 5–10 mm. long, 1–4 mm. wide, coarsely 3–7-toothed, 1-nerved, the smaller leaves suborbicular, 3–5 mm. wide, entire or few-toothed, faintly triplinerved; cystoliths linear; plants dioecious; pistillate flowers in short-peduncled cymes.

Huánuco: Muña, 2,100 meters, *3984*.—Junín: Dos de Mayo, Pichis Trail, 1,800 meters, *Killip & Smith 25885*.—Ayacucho: Carrapa, 1,500 meters, *Killip & Smith 22357*.—Without locality: *Ruiz & Pavón* (type).

Pilea Dombeyana Wedd. Ann. Sci. Nat. III. 18: 221. 1852. *P. orbiculata* Killip, Journ. Wash. Acad. Sci. 15: 53. 1925.

A low, succulent herb; stipules broadly ovate, persistent; leaves borne mostly near the ends of the branches, nearly orbicular, 7–25 mm. wide, short-petiolate, the cystoliths faint, fusiform; plants monoecious or dioecious, the inflorescences unisexual, the staminate flowers sessile in globose clusters in a few-branched panicle, the pistillate in small, densely flowered, sessile cymes.

Huánuco: Chasqui, *3289* (type of *P. orbiculata*).—Dept. uncertain: Between Callcan and Pelechuco, 3,600 meters, *Pearce* in 1864; "Andes," *Dombey* (type).—Without locality: *MacLean;* "*Herb. Hooker 2031*."

Pilea Fendleri Killip, nom. nov. *Urtica dichroa* Poepp. ex Wedd. in DC. Prodr. 16, pt. 1: 61. 1869, as synonym. *P. dauciodora* var.

crenata Wedd. op. cit. 139, not *P. crenata* Britt. & Wils. *P. dauciodora* var. *pilosula* Wedd. loc. cit. *P. leptophylla* Killip, Contr. U. S. Nat. Herb. 26: 387. 1936, not Urban.

A very slender plant, with the stem repent toward the base, at length ascending and few–several-branched; leaves rotund-spatulate, rhombic-orbicular or nearly orbicular, 5–20 mm. long, subequal at a node, cuneate, crenate or crenate-serrate above the middle, thin, glabrous or sparsely pilosulous with hyaline hairs, the cystoliths linear or fusiform, conspicuous; plants monoecious or dioecious, the heads unisexual or androgynous, peduncled in the upper axils.

Huánuco: Cochero, *Poeppig 1552.*—Without locality: *Poeppig 1383.* Also in Venezuela and Colombia.

In a list in the *Prodromus* of species excluded from *Urtica* Weddell gives *U. dichroa* Poepp., an herbarium name apparently, as equaling *Pilea nummularifolia.* He does not, however, cite the name in the synonymy of the latter. Poeppig's No. 1552, in the Vienna herbarium, bears this name in Poeppig's handwriting, though the specimen is clearly not *P. nummularifolia.*

Pilea foliosa Killip, Contr. U. S. Nat. Herb. 26: 377. 1936.

A glabrous, succulent herb with lax branches 50–150 cm. long; leaves of a node unequal and dissimilar, the longer obovate, 5–10 mm. long, entire or obscurely undulate, the smaller subreniform, 1.5–3 mm. wide, entire; cystoliths linear, strongly elevated; plants monoecious, the staminate flowers usually solitary, the pistillate solitary or in small, subsessile clusters.

Junín: Carpapata, 3,000 meters, *Killip & Smith 24400* (type). Huacapistana, 1,900 meters, *Killip & Smith 24281.* Chanchamayo Valley, *Schunke 498, 678, 992.*

Pilea Haenkei Killip, Contr. U. S. Nat. Herb. 26: 384. 1936.

A glabrous herb 25 cm. high or more; leaves of a node similar but very unequal, ovate-lanceolate, acuminate, cordulate, crenate-serrate to the base, triplinerved, densely covered with fusiform and punctiform cystoliths above and fusiform ones beneath, the larger leaves 9–13 cm. long, 3.5–4 cm. wide, petiolate, the smaller ones 1.5–2 cm. long, subsessile; plants dioecious, the staminate cymes sessile or short-peduncled, densely flowered.

Peru, collected in the montaña, but the precise locality unknown, *Haenke 1870* (type).

Pilea hirsuta (Pavón) Wedd. Ann. Sci. Nat. III. 18: 220. 1852. *Urtica hirsuta* Pavón ex Wedd. loc. cit., as synonym.

An erect, robust herb, the stem ferruginous-villous; leaves ovate-elliptic, 7–15 cm. long, 3–7 cm. wide, coarsely serrate, rugulose, ferruginous-hirsute on the nerves and veins, the cystoliths fusiform; plants dioecious, the staminate and pistillate inflorescences similar, paniculate, slightly longer than the adjacent petiole.

Peru, without locality, *Ruiz* (type).

Pilea hyalina Fenzl, Denkschr. Akad. Wiss. Math. Naturw. (Wien) 1: 256. 1850. *Urtica arvensis* Poepp. ex Fenzl, loc. cit., as synonym.

A slender, erect annual, the stem unbranched, pellucid, glabrous; leaves rhombic-elliptic or ovate, 1–6 cm. long, 0.8–4.5 cm. wide, acute, cuneate, coarsely serrate-dentate, thin-membranous, glabrous, or sparsely hyaline-strigillose above, the cystoliths linear, faint; plants monoecious, the inflorescences androgynous, cymose-paniculate, much shorter than the petioles.

Amazonas: Moyobamba, *Mathews 1555*.—San Martín: San Roque, 1,400 meters, *Williams 7149*.—Huánuco: Cochero, *Poeppig 1539*.—Junín: La Merced, 800 meters, *Killip & Smith 23593*. San Ramón, 1,600 meters, *Killip & Smith 24676*. Yapas, Pichis Trail, 1,400 meters, *Killip & Smith 25580*.—Ayacucho: Aina, 750–1,000 meters, *Killip & Smith 22746*.—Without locality: *Mathews 2032; Gay; Ruiz & Pavón*. Widely distributed in the American tropics, from Mexico to Chile, Brazil, and Argentina, at elevations up to 1,500 meters.

Pilea imparifolia Wedd. Ann. Sci. Nat. III. 18: 212. 1852. *P. dendrophila* Miq. in Mart. Fl. Bras. 4, pt. 1: 202. 1853.

A decumbent, glabrous herb with numerous suberect branches; larger leaf rhombic-ovate to elliptic-oblong, rarely obovate, 2–6 cm. long, 0.8–2 cm. wide, crenate-serrate above the middle, oblique, sessile or short-petioled, the smaller leaf obovate-orbicular or orbicular-reniform, 0.8–1.5 cm. long, very asymmetrical, subentire; plants dioecious, the cymes sessile or subsessile, few-flowered.

San Martín: Tarapoto, *Spruce 4434*.—Loreto: Río Itaya, *Killip & Smith 29308, 29515, 29572*. Mouth of Río Napo, *Tessmann 3721*. Mouth of Río Santiago, *Mexia 6365*. Maucallacta, *Klug 3950*. Between Río Ucayali and Río Huallaga, *Huber 1519*.—Junín: San Nicolás, Pichis Trail, *Killip & Smith 26038*. Colombia to northern

Peru, eastward to the Guianas and Amazonian Brazil; at low elevations.

Pilea lamioides Wedd. Ann. Sci. Nat. III. 18: 213. 1852.

An unbranched herb up to 12 cm. high; leaves ovate, 1–2 cm. long, 6–12 mm. wide, coarsely crenate-dentate, obtuse; plants monoecious, the cymes androgynous, borne in the upper axils, the staminate flowers short-pediceled in sessile clusters, the pistillate sessile in short-peduncled clusters.

Lima: San Gerónimo, 150 meters, *5910*. Atocongo, *Pennell 14751*. Amancais, *Weberbauer 1594*.—Without locality: *Dombey* (type); *Pavón*.

Pilea Macbridei Killip, Journ. Wash. Acad. Sci. 15: 52. 1925.

A glabrous plant about 1 meter high, the stem slightly woody, much branched; leaves ovate or orbicular-ovate, 3–5 cm. long, 1.5–2.5 cm. wide, acuminate, cordulate, serrate, the cystoliths linear above, punctiform beneath; plants monoecious, the staminate flowers in a subglobose, slender-peduncled head or in glomerules forming a once branched panicle, the pistillate in short-peduncled cymes.

Huánuco: Río Chinchao, 2,800 meters, *5179* (type).—Junín: Carpapata, 3,000 meters, *Killip & Smith 24457*.

Pilea macrocystolithica Killip, Contr. U. S. Nat. Herb. 26: 384. 1936.

A glabrous, unbranched herb about 30 cm. high; leaves of a node dissimilar and unequal, the larger one ovate or ovate-lanceolate, 4–6 cm. long, 2–3 cm. wide, obtuse or obtusely acuminate, short-petiolate, serrulate, the smaller one suborbicular, 1.5–2 cm. wide, subsessile, the cystoliths of the upper surface very numerous, linear, elevated, 0.7–0.8 mm. long, those of the lower surface shorter and obscure; plants apparently dioecious, the staminate cymes subglobose, on very slender peduncles about 2 cm. long.

Peru, collected in the montaña, the precise locality unknown, *Haenke 1860* (type).

In the original account of this species a line in the description of the cystoliths was accidentally omitted, so that the reason for the selection of the specific name was not at all apparent.

Pilea marginata (Poepp.) Wedd. Arch. Mus. Paris 9: 238. 1856–57. *Urtica marginata* Poepp. ex Wedd. loc. cit., as synonym.

An erect, glabrous herb 80 cm. or more high; leaves oblong or elliptic-oblong, 10–20 cm. long, 4–8 cm. wide, attenuate-acuminate,

undulate, subentire or denticulate toward the apex, coriaceous, the cystoliths stellate, 3-rayed; plants apparently dioecious, the staminate flowers in small glomerules in a short, narrow panicle.

San Martín: Tarapoto, *Ule 6508.*—Huánuco: Cochero, *Poeppig 3045.* Pampayacu, 1,100 meters, *5086.*—Junín: San Nicolás, Pichis Trail, 1,100 meters, *Killip & Smith 26032.*—Dept. uncertain: Río Amazonas, *Poeppig 1088* (type), *2088.*

Pilea microphylla (L.) Liebm. Dansk. Vid. Selsk. Skrift. V. 2: 296. 1851. *Parietaria microphylla* L. Syst. ed. 10. 1308. 1759. *Pilea muscosa* Lindl. Coll. Bot. *pl. 4.* 1821.

A glabrous, succulent herb, 4–30 cm. high, variable in size and habit; leaves usually crowded, thick, short-petioled, obtuse or subacute, entire, those of a pair unequal, the larger usually obovate, up to 1 cm. long, the smaller orbicular or obovate-orbicular, up to 3 mm. long, the cystoliths linear, transverse across the blade; plants monoecious, rarely dioecious, the flower clusters androgynous or unisexual, sessile or subsessile.

Amazonas: Chachapoyas, *Mathews.*—San Martín: Tarapoto, *Williams 6071; Spruce 4028; Ule 6657.* San Roque, *Williams 7233.* Río Huallaga, *Williams 4082, 6662.* Zepelacio, *Klug 3719.*—Loreto: Iquitos, *Killip & Smith 27500.* Puerto Meléndez, *Tessmann 4742.*—Huánuco: Piedra Grande, 1,500 meters, *3690.* Cochero, *Poeppig* in 1830.—Junín: La Merced, 700 meters, *Killip & Smith 24073.* Río Paucartambo, *Killip & Smith 25329.*—Without locality: *Ruiz & Pavón.* Throughout the American tropics. Often cultivated as a border plant or in pots.

Pilea minutiflora Krause, Bot. Jahrb. 37: 529. 1906.

A glabrous herb 30–40 cm. high; leaves ovate-lanceolate or ovate-elliptic, 3–8 cm. long, 1.5–3 cm. wide, acuminate, rounded or cordulate at the base, crenate-serrate, the cystoliths few and faint; plants usually dioecious, the flowers in small clusters, the staminate ones forming a once branched panicle, the pistillate forming subdichotomous cymes up to 7 cm. long.

Junín: Huacapistana, 1,900–2,000 meters, *Weberbauer 2027* (type). Huariaca, 2,900 meters, *3126.*—Puno: Sandía, *Weberbauer 575.*

The Indians are said to use this as a remedy for unrequited love.

Pilea multiflora (Poir.) Wedd. Ann. Sci. Nat. III. 18: 218. 1852, in part. *Urtica multiflora* Poir. in Lam. Encycl. Suppl. 4: 223. 1816. *Pilea anomala* Wedd. Ann. Sci. Nat. III. 18: 217. 1852.

An erect, glabrous herb up to 1 meter high, the stem simple or few-branched; leaves oblong-lanceolate to ovate-lanceolate, 4–15 cm. long, 1.5–4 cm. wide, suboblique, long-acuminate, sharply serrulate, the cystoliths linear and punctiform, faint; plants monoecious or dioecious, the inflorescences unisexual, both kinds cymose-paniculate, diffuse.

Huánuco: Pampayacu, 2,100 meters, *Weberbauer 6812.*—Junín: Pichis Trail, about 1,700 meters, *Killip & Smith, 25775, 25801, 25913, 25929.*—Puno: Sandía, *Weberbauer 6521.*—Cuzco: Cerro de Cusilluyoc, *Pennell 14013.*—Without locality: *Jussieu* (type). Also in Bolivia.

Pilea nerteroides Killip, Contr. U. S. Nat. Herb. 26: 377. 1936. *P. cordifolia* Killip, Journ. Wash. Acad. Sci. 15: 50. 1925, not Benth.

A slender, prostrate herb, leafy throughout; stem villosulous; stipules ovate, persistent; leaves cordate, up to 4 mm. long and 5 mm. wide, villosulous, covered with punctiform cystoliths; staminate flowers borne singly or in pairs, the peduncles 3–6 mm. long; pistillate flowers in 4–6-flowered, pedunculate umbels.

Huánuco: Tambo de Vaca, 4,000 meters, *4395* (type).

Pilea nitida Wedd. Ann. Sci. Nat. III. 18: 211. 1852.

A very slender, glabrous plant, up to 10 cm. high; leaves elliptic-ovate, obtuse at both ends, 4–15 mm. long, 2.5–8 mm. wide, entire or rarely subcrenulate, obscurely 3-nerved, bearing linear cystoliths on the upper surface; plants monoecious, the flowers in compact, androgynous heads shorter than the petioles.

Cajamarca: San Pablo, 2,300 meters, *Weberbauer 3872.*—Lima: San Agustín, *Weberbauer 5244.*—Without locality: *Dombey* (or *Ruiz & Pavón*[?]; type).

Pilea nummularifolia (Sw.) Wedd. Ann. Sci. Nat. III. 18: 225. 1852. *Urtica nummularifolia* Sw. Act. Holm. 1787: 63. *pl. 1, f. 2.* 1787.

A repent or trailing plant, with a slender, villosulous or glabrescent stem; leaves orbicular, 5–12 mm. wide, crenate, strigillose with stiff, hyaline hairs; plants monoecious or dioecious, the inflorescences apparently unisexual, sessile, the staminate subumbellate, the pistillate cymose.

Loreto: Pebas, on the Río Amazonas, *Williams 1917.* Also in Venezuela and the West Indies.

Pilea nutans (Poepp.) Wedd. Arch. Mus. Paris 9: 196. *pl. 7, f. 11–13.* 1856–57. *Urtica nutans* Poepp. ex Wedd. loc. cit., as synonym. *Pilea Herrerae* Mildbr. ex Herrera, Anal. Univ. Cuzco 1: 147. 1926, name only.

A diffuse, much branched, glabrous herb; leaves appearing in 4's (rarely in 3's) due to the presence at each node of 1 or 2 borne on very short branchlets, serrate or crenate-serrate, triplinerved, the cystoliths linear, the larger leaves of a node rhombic-ovate or rhombic-lanceolate, 8–25 mm. long, 4–15 mm. wide, the smaller ones rhombic or broadly ovate, up to 5 mm. long; plants dioecious, the staminate flowers in small, 8–12-flowered, globose heads.

Huánuco: Cochero, *Poeppig 1565* (type).—Junín: Huacapistana, 1,800 meters, *Killip & Smith 24274.* Dos de Mayo, Pichis Trail, *Killip & Smith 25789.* Porvenir, Pichis Trail, *Killip & Smith 25895.* Pasla, *Raimondi 9290.*—Cuzco: Río Yanamayo, *Pennell 14049.* Urubamba Valley, *Cook & Gilbert 1095.* Cosñipata Valley, *Herrera 6.*—Puno: Ollachca, *Raimondi 9649.*—Without locality: *Dombey.* Also in Bolivia. "Chía-chía," "quisa," "yuncaquisa."

Pilea Pavonii Wedd. Ann. Sci. Nat. III. 18: 219. 1852. *Urtica cymosa* Pavón ex Wedd. loc. cit., as synonym.

An erect herb, 40–60 cm. high, with a stout, quadrangular, rufo-villosulous stem; leaves broadly ovate, 6–10 cm. long, 4–6 cm. wide, short-acuminate, crenate-serrate, subcoriaceous, appressed-pilosulous above, densely ferruginous-hirsute beneath, the cystoliths fusiform and punctiform beneath; plants monoecious, the staminate inflorescences borne in the upper axils on stout peduncles, globose, compact, the pistillate sessile or subsessile in the middle axils, cymose-paniculate, much shorter than the adjacent petiole.

Huánuco: Muña, 2,000 meters, *4075.*—Without locality: *Pavón* (type).

Pilea pichisana Killip, Contr. U. S. Nat. Herb. 26: 383. 1936.

A slender, glabrous, subrepent herb, with lax branches up to 20 cm. long; leaves of a node unequal but similar, ovate-lanceolate, acute or acuminate, petiolate, crenate-serrate nearly to the base, the cystoliths all punctiform, the larger leaf 2–2.8 cm. long, the smaller one 0.5–1.2 cm. long; plants dioecious, the pistillate flowers in subsessile cymes.

Junín: Dos de Mayo, Pichis Trail, 1,800 meters, *Killip & Smith 25876* (type).

Pilea Poeppigiana Wedd. Ann. Sci. Nat. III. 18: 225. 1852.

A glabrous plant, with the stem repent, at length erect, 30–50 cm. high; stipules broadly ovate, persistent; leaves ovate-lanceolate, rarely oblanceolate, up to 15 cm. long and 7 cm. wide, acuminate, cuneate at the base, coarsely crenate-serrate, the petioles up to 7 cm. long, the cystoliths fusiform and punctiform; plants dioecious, the pistillate inflorescence cymose-paniculate, borne in the upper axils, long-peduncled.

San Martín: Tarapoto, *Ule 6844*.—Huánuco: Yanano, 1,800 meters, *3770*. Cochero, *Poeppig 1032, 1539B*.—Pichis Trail, 1,800 meters, *Killip & Smith 25826, 25902*.—Department uncertain: "Subandean region," *Poeppig* (type). Also in the Amazon basin of Colombia and Ecuador.

Pilea pubescens Liebm. Dansk. Vid. Selsk. Skrift. V. 2: 302. 1851.

Stem repent, at length erect and usually with several erect or ascending branches, strigillose; leaves massed at the end of the stem or branches, wanting or much reduced below, broadly ovate or elliptic-ovate, up to 7 cm. long and 6 cm. wide, crenate-serrate, sparingly strigillose above with hyaline hairs, or nearly glabrous, hirsutulous beneath on the nerves and veins, the cystoliths linear and fusiform above; plants monoecious or dioecious, the staminate flowers in a sessile cluster at the base of the cymose-paniculate, peduncled pistillate inflorescences, or scattered among the pistillate flowers.

San Martín: San Roque, 1,350–1,500 meters, *Williams 6957, 7695*. Tarapoto, *Spruce 4455*. Widely distributed in the American tropics.

Pilea pulegifolia (Poir.) Wedd. Ann. Sci. Nat. III. 18: 218. 1852. *Urtica pulegifolia* Poir. in Lam. Encycl. Suppl. 4: 224. 1816.

An herb with an elongate stem and numerous densely tomentellous, leafy branches; leaves appearing in 4's due to the presence at each node of a pair borne on a very short branchlet, ovate, 3–6 mm. long, 2–4 mm. wide (those of a node similar but slightly unequal), obtuse, crenate-serrulate, the petioles tomentellous, the cystoliths linear, conspicuous; plants dioecious, the staminate flowers in small, pedunculate cymes in the upper axils.

Peru: Churugallana, *Dombey* (type).

Pilea punctata (HBK.) Wedd. Ann. Sci. Nat. III. 18: 222. 1852. *Urtica punctata* HBK. Nov. Gen. & Sp. 2: 38. 1817.

An erect or ascending, glabrous herb, 20–40 cm. high; leaves ovate, 3–8 cm. long, 1.5–3 cm. wide, acuminate, rounded at the base, coarsely crenate-serrate, triplinerved well above the base, black-punctate beneath, the cystoliths fusiform; plants monoecious or dioecious, the inflorescences androgynous or unisexual, cymose, longer than the adjacent petioles.

Cajamarca: Zaulaca, *Humboldt & Bonpland* (type).—Amazonas: Chachapoyas, 1,600 meters, *Weberbauer 4307*.—Without locality: *Ruiz & Pavón*.

Pilea pusilla Krause, Bot. Jahrb. 37: 530. 1906.

A slender herb up to 10 cm. high, the stem filiform; leaves suborbicular or subreniform, up to 1 cm. long and 1.5 cm. wide, obtuse, subtruncate at the base, sharply serrulate, the cystoliths all punctiform; plants monoecious, the flower clusters forming slender-peduncled panicles.

Junín: Palca, 1,900–2,000 meters, *Weberbauer 2023* (type).

Pilea ramosissima Killip, Contr. U. S. Nat. Herb. 26: 380. 1936.

A diffuse herb, the stem slightly woody, with numerous lateral, pubescent branches; leaves appearing in 4's, unequal and slightly dissimilar, crenate-serrate, essentially glabrous except for the pubescent petioles, the larger leaves rhombic-ovate, 1–3 cm. long, 7–15 mm. wide, obtuse, the smaller ones orbicular or ovate-orbicular, 4–5 mm. long, the cystoliths faint on the under surface; plants dioecious, the pistillate flowers in small, 10-flowered, compact cymes, their peduncles 1–1.3 cm. long.

Huánuco: Chaglla, 2,800 meters, *3650* (type).

Pilea serpyllacea (HBK.) Wedd. Ann. Sci. Nat. III. 18: 205. 1852. *Urtica serpyllacea* HBK. Nov. Gen. & Sp. 2: 37. 1817. *U. thymifolia* HBK. loc. cit. *Pilea globosa* Wedd. Ann. Sci. Nat. III. 18: 208. 1852. *P. thymifolia* Blume, Mus. Bot. Lugd. Bat. 2: 44. 1855.

A glabrous, very succulent herb, red-tinged throughout; leaves nearly globular, 1–5 mm. in diameter, entire or shallowly crenate, transversely striate with linear cystoliths; plants monoecious, or the staminate flowers sometimes wholly wanting, the pistillate flowers in peduncled cymes.

Cajamarca: Hualgayoc, *Weberbauer 4054; Raimondi 2209*. Callacate, *Raimondi* 5639.—Huánuco: Huacachi, 2,000 meters,

3868, 4087. Huánuco, 2,200 meters, *3512; Pearce 118.* Casapí, *Poeppig 1381.*—Lima: Matucana, 2,500 meters, *447.* Río Blanco, 3,200 meters, *Killip & Smith 21601.*—Junín: Carpapata, 2,400 meters, *Killip & Smith 24334.* Tambo de Viso, *Weberbauer 158.*—Cuzco: Cuzco, *Herrera 51; Weberbauer 4892.* Urubamba Valley, 1,800 meters, *Cook & Gilbert 262, 1035; Herrera 2288.* Apurímac Valley, *Herrera 3065.* Ollantaitambo, *Pennell 13657.*—Without locality: *Ruiz & Pavón* (type); *Jussieu.* Western Venezuela to Peru and Bolivia, 2,000–3,500 meters altitude. "Accoicarpa," "quisa," "kkuru-quisa."

Pilea Spruceana Wedd. in DC. Prodr. 16, pt. 1: 161. 1869.

A low herb, the stem repent, at length erect, sparsely villous; leaves oblong or ovate-oblong, 2–8 cm. long, 1.5–4 cm. wide, obtuse or subacute, crenate-serrate, sparingly ciliate, strigillose above, villous beneath, the cystoliths punctiform and fusiform, the latter more numerous at the margin; plants monoecious or dioecious, the pistillate flowers in short-peduncled cymes, the staminate flowers subsessile at the base of the pistillate inflorescence.

San Martín: Tarapoto, *Spruce 4376* (type).—Loreto: Cumbasa, *Ule 6843.*—Huánuco: Posuso, *Pearce 284.* Also in Bolivia.

Pilea strigosa Wedd. Ann. Sci. Nat. III. 18: 225. 1852. *P. repens* var. *strigosa* Wedd. in DC. Prodr. 16, pt. 1: 156. 1869.

A low herb, the stem ferruginous-hirsute, repent at the base, with lax branches; leaves suborbicular to broadly ovate, 8–25 mm. long, rounded or subacute at the apex, crenate-serrate, strigose above, ferruginous-hirsutulous on the nerves beneath; plants usually monoecious, the cymes unisexual, pedunculate, the staminate subglobose, the pistillate paniculiform.

Loreto: Santa Rosa, 135 meters, *Killip & Smith 28835, 28843.*—Huánuco: Cochero, *Poeppig 1552* in part.—Junín: Dos de Mayo, Pichis Trail, *Killip & Smith 25795.*—Without locality: *Mathews 2031* (type). Also in Bolivia.

Pilea subamplexicaulis Killip, Contr. U. S. Nat. Herb. 26: 390. 1936.

A glabrous plant 35 cm. high or more; leaves lanceolate or oblong-lanceolate, 7–20 cm. long, 2.5–6 cm. wide, acuminate or attenuate-acuminate, cordate or slightly clasping at the base, with numerous fusiform and fewer punctiform cystoliths; plants dioecious; stami-

nate flowers in loose cymes up to 2 cm. long, the pistillate in short, sessile cymes.

San Martín: Tarapoto, 1,100 meters, *Ule 6588* (type). San Roque, 1,350–1,500 meters, *Williams 7425*.

Pilea submissa Wedd. in DC. Prodr. 16, pt. 1: 151. 1869.

Plant terrestrial, or repent on tree trunks, the erect or ascending portion of the stem less than 10 cm. long, pubescent; leaves rhombic-elliptic, 4–9 cm. long, 1.5–3.5 cm. wide (extremes up to 15 cm. long and 5 cm. wide), narrowed at both ends, short-petioled, crenate-serrulate, glabrous above, hispidulous on the nerves and veins beneath, the cystoliths fusiform, faint; plants monoecious or dioecious, the cymes unisexual, the staminate borne at the rooting, leafless nodes, their peduncles 4–8 cm. long, the pistillate at the upper axils, their peduncles 2.5–3 cm. long.

San Martín: Tarapoto, *Spruce 4155* (type).—Loreto: Pongo de Manseriche, 250 meters, *Mexia 6359*. Pumuyacu, *Klug 3186*.—Junín: San Nicolás, Pichis Trail, 1,100 meters, *Killip & Smith 26023*.

Pilea suffruticosa Krause, Bot. Jahrb. 37: 529. 1906.

An erect, glabrous, suffrutescent plant, about 2 meters high, the stem unbranched; leaves narrowly elliptic to ovate-elliptic, 5–8 cm. long, 2–3 cm. wide, acute, serrulate, the cystoliths fusiform, prominent; plants apparently dioecious, the staminate inflorescences cymose-paniculate, much longer than the adjacent petiole.

Amazonas: Chachapoyas, 2,500 meters, *Weberbauer 4387* (type).

Pilea verrucosa Killip, Journ. Wash. Acad. Sci. 15: 53. 1925.

A few-branched, glabrous shrub, about 1 meter high, the stem verrucose-roughened; leaves ovate or subrhombic, 2–3.5 cm. long, 1–2.5 cm. wide, acute, crenate-serrate, the cystoliths punctiform; plants monoecious, the inflorescences unisexual, the staminate flowers in much branched panicles in the upper axils, the pistillate in subsessile cymes in the lower axils.

Huánuco: Río Chinchao, 2,800 meters, *5201* (type).

Pilea Weberbaueri Killip, Contr. U. S. Nat. Herb. 26: 380. 1936.

A branched, glabrous herb, up to 30 cm. high; leaves opposite or sometimes appearing in 3's or 4's due to the presence at a node of a pair of leaves on very short secondary branches, without cystoliths, the larger leaves oblong-oblanceolate, 7–12 mm. long, 3–6 mm. wide, obtusely acuminate, petiolate, 3–5-toothed near the apex, the

smaller ones orbicular-reniform, 3–5 mm. long, 4–6 mm. wide, sessile or subsessile; plants apparently dioecious, the pistillate flowers in dense clusters in a compact cyme, the peduncles filiform.

Junín: Between Palca and Huacapistana, 1,900–2,000 meters, *Weberbauer 2022* (type).

Species doubtfully occurring in Peru

Pilea angustata Killip, Contr. U. S. Nat. Herb. 26: 378. 1936. This is based upon a Grisar collection in the Paris Herbarium, said to have come from Ecuador or Peru. In view of other specimens in this collection, it is probable that most, if not all, came from Ecuador.

3. BOEHMERIA Jacq.

Trees, shrubs, or perennial herbs, unarmed; leaves opposite or alternate, toothed, 3-nerved, those of the adjacent nodes sometimes unequal and dissimilar; plants monoecious or dioecious, the flowers in globose, usually unisexual clusters in the leaf axils or forming a spike; staminate flowers 4 (rarely 3 or 5)-parted; pistillate flowers tubular, contracted at the throat, 2–4-toothed or entire, the stigma filiform; achene enclosed in the persistent perianth.

Flower clusters forming long spikes. Leaves opposite. . .*B. caudata.*

Flower clusters in the leaf axils.

Leaves opposite. . . . . *B. Mathewsii.*

Leaves alternate.

Under surface of leaves appressed-silvery-sericeous. .*B. Pavonii.*

Under surface of leaves not sericeous.

Leaves coriaceous, strongly bullate, the larger usually narrowly lanceolate. . . . . *B. aspera.*

Leaves membranous, flat or slightly rugulose, the larger ovate-lanceolate or oblong-lanceolate.

Styles about 1 mm. long; leaves of the adjacent nodes similar and subequal. . . . . *B. brevirostris.*

Styles 1.5–2 mm. long; leaves of the adjacent nodes very dissimilar and unequal.

Leaves coarsely crenate-serrate, pale and pilosulous beneath. . . . . *B. fallax.*

Leaves closely serrulate, concolorous, appressed-hispidulous beneath . . . . . *B. anomala.*

Boehmeria anomala (Wedd.) Killip, sp. nov. *B. Pavonii* var. *anomala* Wedd. in DC. Prodr. 16, pt. 1: 199. 1869.

A slender, open shrub, or a tree, about 4 meters high, the branches flexuose, appressed-hirsutulous; leaves alternate, those of the adjacent nodes very unequal and dissimilar, the larger ovate-lanceolate or oblong-lanceolate, 6–15 cm. long, 1.5–6 cm. wide, attenuate-acuminate, often strongly oblique, closely serrulate, short-petioled, membranous, appressed-hispidulous on both surfaces, concolorous, the smaller leaves (rarely present in herbarium specimens) ovate or suborbicular, 3–5 mm. long, 3 mm. wide, sessile; plants apparently dioecious, the flower clusters about 5 mm. wide.

San Martín: Tarapoto, *Spruce 3962* (type).—Junín: La Merced, 600 meters, *5268.*—Ayacucho: Choimacota Valley, 1,400 meters, *Weberbauer 7529.*

This is more closely related to *B. fallax* than to *B. Pavonii.*

Boehmeria aspera Wedd. Arch. Mus. Paris 9: 349. *pl. 11, f. 24–28.* 1856–57. *B. diversifolia* Wedd. Ann. Sci. Nat. IV. 1: 202. 1854, not Miquel, 1851. *B. Pavonii* var. *diversifolia* Wedd. in DC. Prodr. 16, pt. 1: 199. 1869, in part.

A shrub 1–3 meters high, densely leafy throughout, the branchlets grayish- or blackish-hirsute; leaves alternate, those of the adjacent nodes very unequal and somewhat dissimilar, the larger lanceolate, usually narrowly so, 4–13 cm. long, 1–4 cm. wide, long-acuminate, crenate-serrate, short-petioled, coriaceous, strongly bullate, smooth or hispid above, densely cano-hirsute beneath, the smaller leaves ovate, 1–3 cm. long, 0.8–1.5 cm. wide, acute, subsessile; plants monoecious, the flower clusters up to 8 mm. wide, predominately pistillate, sometimes with a few staminate flowers intermingled.

Huánuco: Piedra Grande, 1,500 meters, *3698.* Muña, *Pearce 120.*—Junín: Palca, *Dombey* (type of *B. diversifolia* Wedd.). Huacapistana, 1,800–2,400 meters, *Killip & Smith 24109, 24352; Weberbauer 1994.*—Ayacucho: Carrapa, 1,500 meters, *Killip & Smith 22324.*—Without locality: *Ruiz & Pavón.* Also in Colombia.

Boehmeria brevirostris Wedd. Ann. Sci. Nat. IV. 1: 201. 1854.

A shrub about 3 meters high, the branchlets cano-hirsute; leaves of the adjacent nodes similar and subequal, ovate or broadly ovate-lanceolate, 3–15 cm. long, 2–7 cm. wide, attenuate-acuminate, usually cordate, coarsely crenate-serrate, membranous, flat, appressed-hispid above, softly pubescent beneath; plants monoecious

or dioecious, the flower clusters 4–6 mm. wide, unisexual or with a few staminate flowers in the pistillate heads; styles about 1 mm. long.

Junín: Río Perené, near Colonia Perené, 600 meters, *Killip & Smith 25168*.—Without locality: *Mathews 2039* in part (type).

Boehmeria caudata Sw. Prodr. 34. 1788. *B. peruviana* Blume, Mus. Bot. Lugd. Bat. 2: 224. 1856.

A shrub or a small tree, up to 8 meters high; leaves opposite, large, broadly ovate to elliptic, up to 25 cm. long and 10 cm. wide, acute or acuminate, finely serrate to crenate-serrate, membranous, flat or rugulose, hispid above, sparingly to densely pubescent beneath; plants dioecious, the flowers in dense clusters forming elongate spikes; fruiting perianth at length broadly obovate, compressed.

Junín: Alcotanga, *Raimondi 9199*.—Ayacucho: Carrapa, *Killip & Smith 22338*.—Cuzco: Urubamba Valley, *Cook & Gilbert 886*. Santa Ana, *Cook & Gilbert 1644*. Cedrobamba, *Herrera 2008*. Machupicchu, *Herrera 3214, 3216, 3244, 3245*.—Puno: Sandía, *Weberbauer 649*.—Without locality: *Gay 636*. Widely distributed in tropical America. "Quisa-quisa" (Cuzco).

Boehmeria fallax Wedd. Arch. Mus. Paris 9: 346. 1856–57. *B. fallax* var. *cordata* Wedd. in DC. Prodr. 16, pt. 1: 198. 1869.

A much branched shrub 2–5 meters high, with slender, hirsutulous or puberulent branches; leaves alternate, those of the adjacent nodes very unequal and dissimilar, the larger ovate-lanceolate or oblong-lanceolate, 2–15 cm. long 1–6 cm. wide, long-acuminate, short-petioled, coarsely crenate-serrate, membranous, flat or slightly rugulose, scaberulous and more or less hispidulous above, pilosulous and pale beneath, the smaller leaves suborbicular-reniform, about 5 mm. wide, few-toothed, sessile, soon deciduous; plants monoecious or rarely dioecious, the flower clusters androgynous or unisexual, up to 5 mm. wide.

Huánuco: Casapí, *Mathews 2036* (type).—Junín: La Merced, 700 meters, *Killip & Smith 23662, 23712*. Between San Nicolás and Azupizú, Pichis Trail, *Killip & Smith 26113*.—Ayacucho: Carrapa, 1,500 meters, *Killip & Smith 22954*. Aina, 1,000 meters, *Killip & Smith 22765*. Estrella, 500 meters, *Killip & Smith 23087*.—Cuzco: Urubamba Valley, 1,800 meters, *Cook & Gilbert 1118*.—Without locality: *Pavón* (type of *B. fallax* var. *cordata*); *Poeppig 1623; Mathews 2037*. Also in Bolivia.

Boehmeria Mathewsii Killip, nom. nov. *Boehmeria hirta* Wedd. Ann. Sci. Nat. IV. 1: 202. 1854, not Swartz, 1788. *B. Weddelliana* Killip, Journ. Wash. Acad. Sci. 15: 55. 1925, not Vidal, 1886.

A compact shrub 1.5–2 meters high, the branches densely hirsute; leaves opposite, broadly ovate, 6–10 cm. long, 3–6 cm. wide (extremes up to 21 cm. long and 13 cm. wide), acuminate, rounded at the base, crenate-serrate, membranous, rugulose, hispid above, cano-tomentose beneath, becoming glabrescent; plants apparently dioecious, the flower clusters axillary, 8–10 mm. wide, the perianth of the pistillate flowers about 2 mm. long.

Huánuco: Muña, 2,200 meters, *4012.*—Without locality: *Mathews 2039* in part (type of *B. hirta* Wedd.).

Boehmeria Pavonii Wedd. Ann. Sci. Nat. IV. 1: 202. 1854. *Procris longifolia* Pavón ex Wedd. loc. cit., as synonym. *Boehmeria Pavonii* var. *diversifolia* Wedd. in DC. Prodr. 16, pt. 1: 199. 1869, in part. *Phenax pallidus* Rusby, Mem. Torrey Club 4: 259. 1895. *B. pallida* Killip, Journ. Wash. Acad. Sci. 21: 347. 1931, excluding synonym "*B. diversifolia* Wedd."

A shrub or a tree, 2–6 meters high, the branchlets nearly straight, finely appressed-pubescent; leaves alternate, those of the adjacent nodes similar but usually very unequal, oblong-lanceolate or elliptic-lanceolate, serrulate or crenate-serrulate, strongly trinerved, distinctly petioled, subcoriaceous, flat or slightly rugulose, appressed-hispidulous above, pale and closely appressed-short-silvery-sericeous beneath, the hairs pointing toward the middle of the areoles, the larger leaves 4–16 cm. long, 1.5–4.5 cm. wide, attenuate-acuminate, the smaller ones 1–3 cm. long, 0.5–1.5 cm. wide, sessile or short-petioled; plants dioecious, rarely monoecious, the flower clusters 6–8 mm. wide, unisexual, rarely androgynous.

San Martín: Tarapoto, *Spruce 4029, 4951; Williams 5772.* Zepelacio, 1,200–1,600 meters, *Klug 3572.* Alto Río Huallaga, *Williams 6314, 6781.*—Loreto: Balsapuerto, 220 meters, *Klug 2915.*—Junín: La Merced, 700 meters, *Killip & Smith 23442.*—Ayacucho: Aina, 800 meters, *Killip & Smith 23125.*—Without locality: *Ruiz & Pavón* (type). Also in Bolivia. "Ishanga."

There has been much confusion regarding this species and *B. diversifolia* Wedd., due to Weddell's varying interpretations in his three surveys of the genus, and to the misidentification of historic collections of *Boehmeria* in several European herbaria. Many of the specimens cited above were distributed as *B. pallida.*

4. PHENAX Wedd.

Unarmed shrubs or suffrutescent herbs; leaves alternate, toothed, rarely entire, 3–5-nerved; plants monoecious or dioecious, the flowers in dense, sessile, axillary clusters, the staminate usually 4-lobed, the pistillate without a perianth, subtended by several bractlets, the stigma elongate-filiform, persistent.

Plants dioecious; leaves usually narrowly lanceolate, attenuate-acuminate..... *P. angustifolius.*

Plants monoecious; leaves ovate or ovate-elliptic (lanceolate in one species), acute, acuminate, or obtuse.

Leaves entire or with 1 or 2 coarse teeth.

Inflorescence densely flowered; leaves lanceolate, 1–2 cm. long, quintuplinerved..... *P. integrifolius.*

Inflorescence loosely flowered; leaves ovate or ovate-lanceolate, less than 1 cm. long, trinerved..... *P. Weddellianus.*

Leaves with several teeth.

Flower clusters unisexual, loosely flowered; leaves coarsely and unequally crenate..... *P. laxiflorus.*

Flowers clusters androgynous; leaves serrate or crenate-serrate.

Leaves essentially glabrous, usually drying light green. *P. laevigatus.*

Leaves pubescent, at least beneath, drying darker.

Stem slender, deeply angled, pilosulous; leaves membranous; staminate and pistillate flowers subequal in number to a cluster..... *P. hirtus.*

Stem stout, subangular, hirsute; leaves coriaceous or subcoriaceous; staminate and pistillate flowers often very unequal in number to a cluster..... *P. rugosus.*

Phenax angustifolius (HBK.) Wedd. Ann. Sci. Nat. IV. 1: 193. 1854. *Boehmeria angustifolia* HBK. Nov. Gen. & Sp. 2: 34. 1817. *Procris longifolia* Poepp. ex Wedd. loc. cit., as synonym. *Phenax Ulei* Krause, Verh. Bot. Ver. Brandenb. 48: 151. 1906.

A slender shrub or suffrutescent herb, up to 3 meters high, with several branches; leaves linear-lanceolate or lanceolate, 5–15 cm. long, 0.5–5 cm. wide, gradually attenuate-acuminate, minutely serrulate, glabrous above, sparingly strigillose on the nerves and veins beneath, the nerves impressed above; plants dioecious; achenes minute, granular, the style 4–5 mm. long.

Loreto: *Raimondi 2203*. Iquitos, *Killip & Smith 27446*. Near Pongo de Manseriche, 100–200 meters, *Killip, Smith & Dennis 29146; Mexia 6323*. Cerro de Escolar (Escalera), 1,200 meters, *Ule 6842* (type of *P. Ulei*).—Junín: Colonia Perené, 700 meters, *Killip & Smith 24911, 25336*. La Merced, *Killip & Smith 23568*.—Ayacucho: Aina, *Killip & Smith 22513*.—Without locality: *Poeppig 1315*. Costa Rica to Colombia, Bolivia, and Brazil.

Phenax Ulei appears to be merely a variant with proportionately broader leaves.

Phenax hirtus (Sw.) Wedd. in DC. Prodr. 16, pt. 1: 235[38]. 1869. *Boehmeria hirta* Sw. Prodr. 34. 1788. *P. urticaefolius* Wedd. Ann. Sci. Nat. IV. 1: 192. 1854, in part. *P. petiolaris* Wedd. loc. cit.

A shrub or suffrutescent herb, 0.5–2.5 meters high, the stem and branches slender, deeply angled, pilosulous; leaves ovate or rarely ovate-lanceolate, 3–12 cm. long, 1.5–7 cm. wide, acute or acuminate, dentate-serrate, thin, flat or slightly rugulose, sparingly hispid above, hirtellous on the nerves beneath; plants monoecious, the glomerules androgynous with the staminate and pistillate flowers nearly equal in number; achenes verruculose.

San Martín: San Roque, 1,400 meters, *Williams 7161*.—Cajamarca: Cajamarca, *Raimondi 1765*. Hualgayoc, *Raimondi 4176*. Chorrillos, *Raimondi 7204*. Tambillo, *Raimondi 4630, 6039*. Callacate, *Raimondi 4227*.—Junín: Alcotanga, *Raimondi 9198*.—Ayacucho: Carrapa, 1,200 meters, *Killip & Smith 22436*. Aina, *Killip & Smith 23176*.—Without locality: *Ruiz & Pavón*. This species is widely distributed in tropical America. Some of the specimens cited above have proportionately longer leaves than in typical Jamaican material, and may represent a variety.

Phenax hirtus var. **minor** Wedd. in DC. Prodr. 16, pt. 1: 235[39]. 1869. *P. urticaefolius* var. *minor* Wedd. Arch. Mus. Paris 9: 496. 1856–57.

Leaves 0.8–3 cm. long, 0.5–2 cm. wide; flower clusters usually smaller than in the typical form.

Loreto: Near Yurimaguas, 135 meters, *Killip & Smith 27863, 28849*.—Cajamarca: Chorrillos, *Raimondi 7760*.—Lima: Matucana, *233, 2883*. Obrajillo, *Wilkes Expedition*. Lima, *Raimondi 12894*.

Phenax integrifolius Wedd. Ann. Sci. Nat. IV. Bot. 1: 193. 1854.

Plant suffrutescent, the stem repent, at length procumbent or ascending, diffusely branched, villous; leaves crowded, lanceolate,

1–2 cm. long, 3–8 mm. wide, entire, quintuplinerved, pilose; plants monoecious, the glomerules densely flowered, androgynous; achenes minutely granular.

Type a Peruvian plant collected by Pavón.

Phenax laevigatus Wedd. Ann. Sci. Nat. IV. 1: 192. 1854; Arch. Mus. Paris 9: 497. *pl. 16A*. 1856–57.

A shrub 1–2.5 meters high, with spreading branches, the younger ones pilosulous; leaves ovate, 3–9 cm. long, 1.5–4 cm. wide, acute or acuminate, coarsely crenate-serrate or serrate, coriaceous, essentially glabrous, sublustrous; plants monoecious, the glomerules androgynous, 5–8 mm. in diameter.

Amazonas: Chachapoyas, *Mathews 1556*.—Huánuco: Mito, 2,700 meters, *1503*. Huacachi, 2,000 meters, *4153*. Pillao, *Ruiz & Pavón*.—Junín: Huasa-huasi, *Dombey* (type). Huacapistana, *Killip & Smith 24099*. Palca, *Weberbauer 1775*.—Lima: Above Lima, *Raimondi 12548*.—Ayacucho: Carrapa, 2,200 meters, *Killip & Smith 22312*.—Cuzco: Valle del Apurímac, *Herrera*. Also in Ecuador and Bolivia.

Phenax laxiflorus Wedd. Arch. Mus. Paris 9: 499. 1856–57.

Plant suffrutescent, the branches slender, puberulent; leaves ovate or elliptic, 1.5–4 cm. long, 1–2 cm. wide, obtuse, coarsely and unequally crenate with 2–4 crenations to a side, pilosulous above, finely pubescent beneath; plants monoecious, the glomerules loosely flowered, unisexual, the staminate in the lower axils, the pistillate in the upper.

Huánuco: Pillao, *Ruiz & Pavón* (type). Muña, 2,500 meters, *4282*, referred here doubtfully.

Phenax rugosus (Poir.) Wedd. in DC. Prodr. 16, pt. 1: 235[38]. 1869. *Procris rugosa* Poir. in Lam. Encycl. 5: 628. 1804. *Boehmeria ballotaefolia* HBK. Nov. Gen. & Sp. 2: 35. 1817. *Phenax ballotaefolius* Wedd. Ann. Sci. Nat. IV. 1: 192. 1854.

A shrub 2–3.5 meters high, the stem stout, subangular, densely hirsute; leaves ovate, 4–12 cm. long, 2.5–7 cm. wide, crenate-serrate, coriaceous or subcoriaceous, rugose, usually villous-tomentose beneath; plants monoecious, the glomerules very dense, the staminate and pistillate flowers often very unequal in number in a glomerule; achenes verruculose.

Huánuco: Muña, *Pearce 158*.—Junín: Carpapata, 3,000 meters, *Killip & Smith 24420*.—Cuzco: Ollantaitambo, 3,000 meters, *Cook*

& Gilbert 588. Urubamba Vallay, *Herrera 2248.* Vilcanota Valley, *Herrera 1077.*—Dept. uncertain: Panahuanca, *Mathews 931.*—Without locality: *Jussieu* (type); *Mathews 2033; Gay 360, 1661.* Mexico to Venezuela and Bolivia. "Monte-pespeta" (Cuzco).

Phenax rugosus var. **minor** Wedd. in DC. Prodr. 16, pt. 1: 235[38]. 1869.

Leaves elliptic-ovate, 1.5–2 cm. long, 0.8–1 cm. wide, subsessile, serrate, thick-coriaceous, bullate, lustrous, glabrous above, tomentellous beneath.

Junín: Tarma, *Mathews 669* (type).

Phenax Weddellianus Killip, Journ. Wash. Acad. Sci. 24: 43. 1934.

Plant suffrutescent, with a slender, glabrescent stem, diffusely branched; leaves ovate or ovate-lanceolate, 5–18 mm. long, 3–8 mm. wide, entire or with 1–2 coarse teeth on either side, trinerved, sparingly strigillose above, pilosulous beneath; plants monoecious, the clusters loosely flowered, androgynous or rarely unisexual; achenes narrowly ovoid.

Cuzco: *Gay* (type).

5. MYRIOCARPA Benth.

Unarmed trees or shrubs; leaves alternate, petiolate, toothed or rarely subentire, trinerved, bearing cystoliths; plants dioecious, rarely monoecious; staminate flowers in glomerules forming slender, dichotomous spikes, the perianth 4-parted; pistillate flowers in slender, elongate, dichotomous, sub-unilateral spikes, rarely in panicles, without a perianth, the achenes compressed, stipitate or sessile, often setose at the margin, the stigma lateral, semilunate.

Leaves ovate to ovate-oblong, conspicuously toothed nearly to the base, membranous, the cystoliths of the upper surface conspicuous.....*M. stipitata.*

Leaves prevailingly obovate, undulate-serrulate in the upper half, coriaceous, the cystoliths obscure.....*M. laevigata.*

Myriocarpa laevigata Killip, Journ. Wash. Acad. Sci. 15: 55. 1925.

A compact tree or shrub, up to 5 meters high, essentially glabrous throughout; leaves obovate, rarely ovate, 7–14 cm. long, 4–8 cm. wide, abruptly acuminate or acute, shallowly undulate-serrulate above the middle, coriaceous, the cystoliths obscure; plants dioecious or some-

times monoecious, the spikes unisexual, once or twice forked near the base, 6–15 cm. long; staminate flowers sessile in contiguous clusters; achenes ovate-elliptic, setose at the margin, stipitate.

Huánuco: Muña, 2,300 meters, *3925* (type). Yanano, 1,800 meters, *3783*. Río Posuso, 1,900–2,000 meters, *Weberbauer 6735, 6743*.—Junín: Huacapistana, 1,800 meters, *Killip & Smith 24186*.

Myriocarpa stipitata Benth. Bot. Voy. Sulph. 168. *pl. 55*. 1844. *M. densiflora* Benth. op. cit. 169. *M. Dombeyana* Wedd. Ann. Sci. Nat. III. 18: 232. 1852. *M. densiflora* var. *Dombeyana* Wedd. Arch. Mus. Paris 9: 487. 1856–57.

A tree 3–9 meters high, with a slender trunk, the branchlets usually hirsute-tomentose; leaves broadly ovate to ovate-oblong, 10–25 cm. long, 6–12 cm. wide, acuminate, rounded or cordulate at the base, crenate to crenate-serrulate, rugulose with age, bearing on the upper surface conspicuous cystoliths which radiate from the center of the areoles, membranous, essentially glabrous above, sparingly pilosulous to densely tomentose beneath; spikes 1–3 times forked near the base, the staminate shorter than the leaves, the pistillate often much longer, up to 30 cm. long; achenes elliptic, 1–1.5 mm. long, subsessile or usually stipitate, generally setose at the margin.

Piura: Prov. Huancabamba, 1,300 meters, *Weberbauer 6014*.—San Martín: Tarapoto, 750 meters, *Spruce 4286; Ule 6507; Williams 6145*. Pongo de Cainarachi, 230 meters, *Klug 2748*. Zepelacio, *Klug 3536*.—Loreto: Balsapuerto, 220 meters, *Klug 2898*. Pongo de Manseriche, *Mexia 6252*. Río Nanay, *Williams 414*. Cuschi, 1,600 meters, *4838*. Pampayacu, *Sawada 16*.—Junín: Huasa-huasi, *Dombey* (type of *M. Dombeyana*). Carpapata, 2,700 meters, *Killip & Smith 24374*. Huacapistana, 2,000 meters, *Killip & Smith 24139*. La Merced, 600 meters, *5454; Killip & Smith 23475, 24059, 24064, 24075, 24077, 25386*. Dos de Mayo, Pichis Trail, *Killip & Smith 25837, 25856*.—Ayacucho: Carrapa, 1,000 meters, *Killip & Smith 22467, 22487*. Aina, 900 meters, *Killip & Smith 22687*. Estrella, 500 meters, *Killip & Smith 23073*. Kimpitiriki, 400 meters, *Killip & Smith 22952*.—Cuzco: Urubamba Valley, 1,800 meters, *Cook & Gilbert 937, 1047, 1147*.—Without locality: *Mathews 2040* (type of *M. densiflora*). Colombia to Venezuela and Ecuador. "Ishanga" (Tarapoto), "tigre-tigre" (Cuzco).

M. densiflora was differentiated from *M. stipitata* on the basis of the leaves being softly tomentose beneath and the achenes sub-

sessile rather than stipitate, and the two species have always been considered distinct. The large number of specimens now available fail to show a correlation of these or any other characters; the degree of indument is highly variable and, even in a single spike, there is variation in the relative length of the stipe to the body of the achene.

6. URERA Gaud.

Trees or shrubs, usually with stinging hairs; leaves alternate, stipulate, petiolate, the cystoliths punctiform, linear, or wanting; plants usually dioecious, the flowers small, in axillary, dichotomous or irregularly branched cymes, the staminate with a 4–5-parted perianth and 4–5 stamens, the pistillate with 4 equal or unequal segments; stigma penicillate persistent; achene straight or oblique, at least partially surrounded by the fleshy, enlarged perianth.

Leaves incised-lobed usually more than halfway to the midnerve. *U. laciniata.*

Leaves not lobed, dentate, crenate, or subentire.

Achenes more than 2 mm. long; leaves coarsely dentate or sinuate-dentate ..... *U. baccifera.*

Achenes less than 2 mm. long; leaves crenate-dentate. *U. caracasana.*

Urera baccifera (L.) Gaud. in Freyc. Voy. Uran. Bot. 497. 1826. *Urtica baccifera* L. Sp. Pl. ed. 2. 1398. 1763.

A coarse, erect, subligneous herb, or a shrub, 1–4 meters high, the stem densely covered with short, stout, stinging prickles; leaves broadly ovate or round-ovate to oblong-ovate, up to 35 cm. long and 15 cm. wide, rounded or cordate at the base, coarsely dentate or irregularly sinuate-dentate, glabrescent, rarely densely pubescent, or with hairs or prickles, especially on the nerves; plants dioecious, the flowers in much branched cymes; fruit succulent, white or rose-colored, 3–5 mm. long.

San Martín: Chazuta, 260 meters, *Klug 4029.*—Loreto: Río Marañón Valley, 150 meters, *Killip, Smith & Dennis 29169.* Río Itaya, 110 meters, *Killip & Smith 29376, 29465, 29579; Williams 3423.* Mishuyacu, 100 meters, *Klug 1085.* Lower Río Huallaga, *Williams 4350.*—Huánuco: Muña, 2,200 meters, *3910.* Monzón, *Weberbauer 3497, 3498.*—Junín: Pichis Trail, *Killip & Smith 25904, 26105, 26356.*—Ayacucho: Aina, 900 meters, *Killip & Smith 22794.* —Madre de Dios: Seringal, *Ule 9330.* Widely distributed in tropical America.

Urera caracasana (Jacq.) Gaud. ex Griseb. Fl. Brit. W. Ind. 154. 1859. *Urtica caracasana* Jacq. Hort. Schoenbr. 3: 71. *pl. 396.* 1798. *Urera Jacquini* Wedd. Ann. Sci. Nat. III. 18: 200. 1852. *U. subpeltata* Miq. in Mart. Fl. Bras. 4, pt. 1: 189. *pl. 66.* 1853. *U. acuminata* Miq. op. cit. 190, not Gaud. *U. Jacquini* var. *subpeltata* Wedd. Arch. Mus. Paris 9: 145. 1856–57. *U. Jacquini* var. *Miqueli* Wedd. loc. cit. *U. caracasana* var. *subpeltata* Wedd. in DC. Prodr. 16, pt. 1: 90. 1869. *U. caracasana* var. *Miqueli* Wedd. loc. cit. *U. capitata* var. *Pavonii* Wedd. op. cit. 92.

A shrub 1–6 meters high, with elongate branches, the young twigs, petioles, inflorescence, and leaf veins usually armed with stinging hairs; leaves broadly ovate or sometimes ovate-lanceolate, variable in size, up to 30 cm. long and 25 cm. wide, acuminate, cordate at the base, usually with an open sinus but sometimes with a closed sinus and overlapping basal lobes, crenate-dentate, scabrous above, more or less pubescent beneath; plants dioecious, the cymes regularly dichotomous, shorter than the petioles or often much longer, the staminate flowers sessile in distinct, compact glomerules, the pistillate flowers usually ternate, sometimes single or in dense clusters, pedicellate or subsessile.

San Martín: Zepelacio, *Klug 3554.* Tarapoto, *Spruce 4305.*—Loreto: Lower Río Huallaga, *Williams 4288, 4308, 4796, 4945.* Iquitos, *Tessmann 3584; Williams 8041.* Río Marañón, *Killip & Smith 27518, 29230; Tessmann 3857, 4118.* Pumayacu, *Klug 3174.* Mishuyacu, *Klug 441, 1071.* Río Putumayo, *Klug 1639.* Río Napo, *Mexia 6469.* Río Amazonas, *Williams 1861, 2005, 2673, 2789.* Río Nanay, *Williams 490, 505, 802, 1256.* Cerro de Escalera, *Ule 45* in part. Yarina-cocha, *Tessmann 3198.*—Huánuco: Casapí, *Mathews 2030.* Monzón, *Weberbauer 3704.*—Junín: La Merced, *Killip & Smith 23929.* Río Perené, *Killip & Smith 25151.*—Ayacucho: Kimpitiriki, *Killip & Smith 22935.*—Madre de Dios: Seringal, *Ule 9332.*—Dept. uncertain: Pampa del Sacramento, *Castelnau.*—Without locality: *Ruiz & Pavón* (type of *U. capitata* var. *Pavonii*); *Gay; Poeppig; Fox 32.* Widely distributed in tropical America. "Ishanga," "ishangu del agua."

Urera caracasana is here interpreted in its widest sense. Many of the specimens from northern Peru cited above have proportionately narrower leaves than in the typical form and represent the variety *subpeltata.* If further study proves that *U. capitata,* with the pistillate flowers sessile in dense heads, is specifically distinct from *U. caracasana,* some of this material, including the type of *U.*

capitata var. *Pavonii*, should be placed in that species. At present it seems best to treat these as representing a young stage of *U. caracasana*.

Urera laciniata (Goudot) Wedd. Ann. Sci. Nat. III. 18: 203. 1852. *Urtica laciniata* Goudot ex Wedd. loc. cit., as synonym.

An erect, tree-like herb or often truly arborescent, 1–4 meters high, the branches densely covered with stout bristles or spines; leaves 15–35 cm. long and wide, deeply incised-lobed (lobes acuminate, entire or few-toothed), membranous, spiny on the nerves beneath, glabrescent; plants dioecious, the cymes up to 20 cm. long, the staminate flowers in glomerules, the pistillate in glomerules or distinct; achenes suborbicular, nearly 2 mm. long.

San Martín: Tarapoto, *Spruce 4140*. Alto Río Huallaga, *Williams 6799*. San Roque, 1,350–1,500 meters, *Williams 7785*.—Loreto: Mishuyacu, 100 meters, *Klug 1079*. Río Nanay, *Williams 451*. Yurimaguas, 200 meters, *Williams 4937*. Río Ucayali, *Tessmann 3177*.—Huánuco: Posuso, 600 meters, *4703*.—Junín: La Merced, 600 meters, *5315*. Puerto Yessup, 400 meters, *Killip & Smith 26319*.—Ayacucho: Estrella, 500 meters, *Killip & Smith 22645*.—Without locality: *Haenke 1730; Ruiz & Pavón*. Costa Rica to Venezuela, Peru, and Bolivia. "Ishanga."

7. **POUZOLZIA** Gaud.

Low shrubs, rarely woody vines; leaves alternate, entire, toothed in only a few American species, petiolate, 3-nerved, the upper surface densely covered with punctiform cystoliths; plants monoecious, rarely dioecious, the flowers in small, axillary clusters or in leafless spikes; staminate perianth 4–5-parted or lobed, the stamens 3–5; pistillate perianth tubular, 2–4-toothed, usually costate, the ovary included, the stigma filiform, at length deciduous, the achenes crustaceous, shiny.

Leaves entire.

Flower clusters in leafless spikes; plants scandent, dioecious, glabrescent ..... *P. formicaria.*

Flower clusters in the leaf axils; plants monoecious, densely pubescent.

Under surface of the leaves hirtellous on the nerves, compactly white-lanate between the nerves ..... *P. Poeppigiana.*

Under surface of leaves densely brown-hirsute ..... *P. obliqua.*

Leaves coarsely crenate-serrate ..... *P. longipes.*

Pouzolzia formicaria (Poepp.) Wedd. Arch. Mus. Paris 9: 407. 1856–57. *Boehmeria formicaria* Poepp. ex Wedd. Ann. Sci. Nat. IV. 1: 201. 1854.

A woody vine or a scandent shrub; leaves oblong-lanceolate, 4–12 cm. long, 2–6 cm. wide, acuminate, rounded or cordulate at the base, entire, subcoriaceous, concolorous, scabrid above, essentially glabrous; plants dioecious, the flower clusters borne in spikes 8–15 cm. long; pistillate perianth about 2 mm. long, hispidulous; achenes conical, about 1.5 mm. long, brownish white, the style about 3 times longer, densely pubescent.

Loreto: Mainas, *Poeppig 2287* (type). Río Paranapura, 200 meters, *Klug 3944*. Rancho Indiana, 110 meters, *Mexia 6411*. Mishuyacu, 100 meters, *Klug 930*. Iquitos, 120 meters, *Williams 8117; Tessmann 3585, 3897, 3898*. Río Ucayali, *Tessmann 3336*. Lower Río Nanay, *Williams 557*. Florida, Río Putumayo, 200 meters, *Klug 1998, 2030, 2354*.

Pouzolzia longipes Killip, sp. nov. *P. procridioides* var. *hirsuta* Wedd. in DC. Prodr. 16, pt. 1: 231. 1869(?).

Herba monoica; folia late ovata, acuminata, grosse crenato-serrata, supra setulosa, subtus in nervis puberula; glomeruli axillares, androgyni vel unisexuales, perianthio masc. 4-lobato; achaenia conica.

An herb 60–75 cm. high, woody below, the stem sparingly pilosulous, at length glabrous, angulate; leaves broadly ovate, 5–10 cm. long, 3–6 cm. wide, acuminate, rounded and abruptly narrowed at the base, coarsely crenate-serrate, membranous, sparingly setulose above, puberulent on the nerves beneath, otherwise glabrous, the petioles 2–5 cm. long; plants monoecious, the flower clusters axillary, 5–8 mm. wide, androgynous or unisexual; staminate perianth about 2.5 mm. long, deeply 4-lobed; pistillate perianth 1–1.5 mm. long, scaberulous; achenes conical, nearly 1 mm. long, light brown, the styles 3 mm. long, pubescent.

Junín: Eneñas, Pichis Trail, 1,700–1,900 meters, dense forest, July 2, 1929, *Killip & Smith 25753* (type, U. S. Nat. Herb. No. 1,359,857; Field Mus. No. 632,801).

This species, one of the few American ones with toothed leaves, is nearest the African *P. procridioides* (E. Mey.) Wedd., and agrees well with the Bonpland specimen at Paris, labeled merely "Amer. Trop.," which Weddell referred to *P. procridioides*. In addition to the improbability of the African species occurring in Peru, there are

slight differences in the toothing of the leaves, the indument, and the size of the achenes which suggest that another species is represented.

The type of *P. procridioides* var. *hirsuta*, a Pavón specimen in the Boissier Herbarium, not examined in connection with the present studies, may be *P. longipes*, though the description of the indument does not well apply to the specimen cited above.

Pouzolzia obliqua (Poepp.) Wedd. Arch. Mus. Paris 9: 405. 1856–57. *Margarocarpus obliquus* Wedd. Ann. Sci. Nat. IV. 1: 204. 1854. *Boehmeria obliqua* Poepp. ex Wedd. loc. cit., as synonym.

A shrub or a small tree, 2–5 meters high, densely hirsute nearly throughout; leaves oblong or oblong-lanceolate, 2–14 cm. long, 1–5 cm. wide, attenuate-acuminate, rounded or cordulate at the base, oblique, short-petioled, hispid above; plants monoecious or dioecious, the flower clusters axillary, androgynous or unisexual; achenes light brown or white, the styles 8–10 mm. long.

San Martín: Juanjui, *Klug 4169*.—Loreto: Mainas, *Poeppig 2032* (type). Guatemala to Venezuela and Peru, evidently uncommon in Peru.

Pouzolzia Poeppigiana (Wedd.) Killip, Journ. Wash. Acad. Sci. 21: 347. 1931. *Margarocarpus Poeppigianus* Wedd. Ann. Sci. Nat. IV. 1: 204. 1854. *M. asper* Wedd. loc. cit. *Boehmeria discolor* Poepp. ex Blume, Mus. Bot. Lugd. Bat. 2: 206. 1856. *B. aspera* Blume, loc. cit., footnote, not Wedd. *Pouzolzia discolor* Wedd. Arch. Mus. Paris 9: 408. *pl. 13B, f. 18–24*. 1856–57. *P. aspera* Wedd. in DC. Prodr. 16, pt. 1: 233. 1869, not Wight.

A shrub 1–5 meters high, with elongate, villous branches; leaves lanceolate or oblong-lanceolate, 2–15 cm. long, 1–4.5 cm. wide, acuminate, rounded at the base, symmetrical or nearly so, entire, above scabrous and hirsutulous, beneath rufo-hirtellous on the nerves and compactly white-lanate between them; plants monoecious, the flower clusters axillary, androgynous or unisexual, the styles up to 1.5 cm. long, the achenes light brown or white, about 1 mm. long.

San Martín: Lamas, 840 meters, *Williams 6442; Spruce*. Alto Río Huallaga, *Williams 6683*. Zepelacio, 1,400 meters, *Klug 3437*.—Loreto: Río Amazonas, *Poeppig 3044*.—Huánuco: Río Huallaga Canyon, 1,200 meters, *4328*.—Junín: La Merced, 700 meters, *Killip & Smith 23386, 23528, 23586, 23938*. Colonia Perené, *Killip & Smith 25024*.—Ayacucho: Carrapa, 1,000 meters, *Killip & Smith 22471*.—Cuzco: *Bues* in 1930.—Without locality: "Peru subandina,"

Poeppig 1284 (type; also type of *P. discolor*); *Ruiz & Pavón; Gay; Mathews 2036, 2037.* Also in Bolivia.

8. FLEURYA Gaud.

Annual herbs, usually with stinging hairs; leaves alternate, petiolate, toothed, trinerved; plants monoecious or dioecious, the flowers in clusters in large panicles, the staminate 4–5-parted, the pistillate with 4 imbricate perianth segments, the stigma papillose, at length hooked; achenes oblique, compressed.

Fleurya aestuans (L.) Gaud. in Freyc. Voy. Uran. Bot. 497. 1826. *Urtica aestuans* L. Sp. Pl. ed. 2. 1397. 1762. *F. glandulosa* Wedd. Ann. Sci. Nat. III. 18: 205. 1852. *F. aestuans* var. *glandulosa* Wedd. Arch. Mus. Paris 9: 112. 1856–57. *F. aestuans* var. *racemosa* Wedd. in DC. Prodr. 16, pt. 1: 72. 1869.

An erect, simple or few-branched herb, up to 1.2 meters high, the stem sometimes glandular; leaves broadly ovate, 7–17 cm. long, 2.5–12 cm. wide, acute or acuminate, coarsely and sharply dentate, slender-petioled, membranous, usually with a few stinging hairs on the upper surface; panicles usually androgynous; achenes 1–1.5 mm. long.

Loreto: Fortaleza, *Williams 4462.* Puerto Arturo, 135 meters, *Killip & Smith 27755; Williams 5130, 5195.* Iquitos, 100 meters, *Killip & Smith 27074; Williams 1340, 1348, 8099, 8193.* Lower Río Nanay, *Williams 353.* La Victoria, *Williams 2603.* Nauta, *Raimondi 2173.*—Without locality: *Poeppig 2086; Ruiz & Pavón.* Throughout tropical America.

9. PARIETARIA L.

Diffuse or tufted, slender herbs, without stinging hairs; leaves alternate, entire, trinerved; flowers in small, axillary glomerules, the staminate, pistillate, and perfect intermixed; perianth tubular, 4-parted; achenes straight, ovoid, lustrous.

Parietaria debilis Forst. Fl. Ins. Austr. Prodr. 73. 1786. *P. debilis* var. *ceratosantha* Wedd. Arch. Mus. Paris 9: 515. 1856–57.

An erect or diffuse, pilosulous or glabrescent, annual herb; leaves ovate, rhombic-ovate, or orbicular-ovate, 5–20 mm. long, obtuse or rounded at the apex; clusters few-flowered.

Cajamarca: Cascas, *Raimondi 8174.* Tambillo, *Raimondi 7995.* —Lima: Matucana, 2,500 meters, *262.* Lima, *5870; Rose 18581.* Lurín, *5968.* Atocongo, *Pennell 14795.*—Arequipa: Mollendo,

Hitchcock 22391, 22410; Johnston 3552. Tiabaya, 2,000 meters, *Pennell 13072.* Arequipa, 2,600 meters *Pennell 13194.*—Locality uncertain: *Dombey; Weddell.* Widely distributed in the warmer parts of the world.

50. PROTEACEAE. Protea Family

Besides the following genera of this family, which is best represented in Australia, the silk-oak of Australia, *Grevillea robusta* Cunn., is doubtless cultivated, as in all warm regions, for shade. It may be known by its fern-like leaves, silky-pubescent beneath.

Flowers showy, conspicuous above the leaves; hypogynous glands large, or the disk entire or obscurely 3-lobed . . . 1. *Embothrium.*

Flowers rather small, often inconspicuous; hypogynous glands or scales 3–4 or the disk 4-lobed.

Inflorescence axillary, at least in part, 1–5 cm. long; hypogynous glands 3; style laterally expanded . . . . . 2. *Lomatia.*

Inflorescence usually terminal, often longer than the leaves; hypogynous scales or glands 4.

Leaves conspicuously net-veined; fruit tardily dehiscent.

Leaves entire . . . . . 3. *Panopsis.*

Leaves pinnate . . . . . 4. *Euplassa.*

Leaves inconspicuously net-veined; fruit early dehiscent. 5. *Roupala.*

1. EMBOTHRIUM Forst.

Oreocallis R. Br. Trans. Linn. Soc. 10: 196. 1811.

Tall shrubs with long, willow-like branches, the ultimate terminated by dense racemes of showy, strap-shaped, 1-petaled flowers. Style oblong-fusiform or oblique at the tip.—The herbarium name *Catas* Dombey is mentioned in synonymy by Lamarck, Encycl. 2: 355. 1786.

Inflorescence more or less reddish-pubescent . . . . . *E. grandiflorum.*

Inflorescence glabrous, often pruinose-glaucous.

Leaves mostly 3–3.5 cm. wide, rarely 10 cm. long. *E. mucronatum.*

Leaves mostly 4–5 cm. wide, usually 10–15 cm. long. *E. Weberbaueri.*

Embothrium grandiflorum Lam. Encycl. 2: 354. 1786. *E. emarginatum* R. & P. Fl. 1: 62. *pl. 95.* 1798. *Oreocallis grandiflora* R. Br. Trans. Linn. Soc. 10: 197. 1811.

Branchlets dark-barked, the youngest reddish-tomentose as the new leaves beneath; petioles 1–2 cm. long; leaves coriaceous, glabrous and lustrous above, elliptic, acutish at the base, rounded and mucronate or somewhat emarginate at the apex, about 10 cm. long and half as wide; racemes often finally 10 cm. long; pedicels 1 cm. long in flower, 3 cm. in fruit; flowers reddish, curved, 4–5 cm. long, the perianth deeply 4-parted; anthers ovate, sessile; styles as long as the perianth, persisting with the obliquely directed, peltate stigma on the oblong-cylindric capsule; seeds winged, orbicular, compressed.—A shrub or tree of 1–6 meters. Meisner in DC. Prodr. 14: 445. 1856, distinguished, under the name *Oreocallis grandiflora:* var. *emarginata* (R. & P.) Meisn., the leaves beneath and the branchlets pubescent; var. *obtusifolia* Meisn., the leaves glabrate; and var. *acutifolia* Meisn., similar to the last but the leaves acute. Weberbauer (86) notes that the species is a widely spread east-Andean type which, however, occurs in the inter-Andean valleys of the Huallaga, etc., even to the western slopes in Cajamarca. Ruiz and Pavón found the crushed leaves applied to bruises and to aching teeth, and the flowering branches used to adorn altars and the arches carried in processions. Illustrated, Weberbauer, 160.

Cajamarca: San Pablo, 2,400 meters, *Weberbauer 3826;* 256. Huambos, 2,600–3,000 meters (Weberbauer 260). Toward Hualgayoc, 2,200 meters (Weberbauer 189).—Ancash: Huaraz (Weberbauer 179). Pichiu, 3,500 meters, *Weberbauer 2922.*—Huánuco: Mito, *1380.* Fifteen miles northeast of Huánuco, 3,000 meters, *2149.* Yanano, 1,800 meters, *4936.* Palca and Huasa-huasi, *Ruiz & Pavón.* Between Huánuco and Pampayacu, *Kanehira 66.*—Junín: Huacapistana, 1,700 meters, *Weberbauer 1742;* 246. Chanchamayo, *Isern 2179, 2302.*—Cuzco: Valle de Lares (*Herrera 788*). Santa Ana, 1,900 meters, *Weberbauer 5000;* 281. Without locality, *Diehl 2523.* Pillahuata, 2,800 meters, *Pennell 14084.* Ecuador. "Salta-perico," "tsacpá," "cucharilla," "zacpá," "llamas," "chappa," "cocániro," "picahua," "catas," "machinparrani," "mastimpanraní."

Embothrium mucronatum Willd. ex R. & S. Syst. 3: 33. 1818. *Oreocallis Ruizii* Klotzsch, Linnaea 20: 474. 1847.

Apparently very similar to *E. grandiflorum* but glabrous or nearly so and the leaves often much smaller, oblongish, mucronate, somewhat lustrous above; terminal thyrse lax, the bracts sparsely pilose. —A small shrub, perhaps only a variety of *E. grandiflorum.* Neg. 11772.

Huánuco: *Ruiz* (type). Pampayacu, *Sawada P41.*—Amazonas: Chachapoyas, *Raimondi* (det. Diels); at 2,700 meters, *Williams 7551.* Ecuador. "Picahuay."

Embothrium Weberbaueri Perk. Bot. Jahrb. 45: 434. 1911.

A shrub of 3–5 meters, resembling *E. mucronatum* in lack of pubescence but perhaps distinguishable by the larger, mostly emarginate, obscurely mucronulate leaves and the terminal, racemose inflorescence; racemes 20 cm. long or longer, the slender pedicels 2 cm. long; flowers rose-colored, 3.5–4 cm. long; fruits 4 cm. long, the beak 2.5–3 cm. long, on stipes to nearly 4 cm. long. Neg. 11773.

Huánuco: Monzón, Prov. Huamalíes, 1,000–1,500 meters, *Weberbauer 3464* (type).—San Martín: East of Moyobamba, 1,100 meters, *Weberbauer 4762* (det. Perkins). Near Moyobamba, *Klug 3417.* San Roque, 1,400 meters, *Williams 7320, 7668.*

2. LOMATIA R. Br.

A shrub allied to *Embothrium,* but the axillary racemes relatively short and few-flowered. Style expanded laterally at the tip.—The generic name has been conserved.

Lomatia hirsuta (Lam.) Diels, comb. nov. *Embothrium hirsutum* Lam. Encycl. 2: 355. 1786. *E. obliquum* R. & P. Fl. 1: 63. *pl. 97.* 1798. *L. obliqua* R. Br. Trans. Linn. Soc. 10: 196. 1811.

A glabrous-leaved shrub 2–3 meters high with reddish-villous racemes about as long as the leaves, these coriaceous, lustrous above, often colored beneath, ovate, very unequally serrate, 5–12 cm. long, 2–5 cm. broad; perianth 1 cm. long, white; fruits pedicellate, 2.5–3.5 cm. long.—Some part of the plant is said to supply a dye.

Cajamarca: San Miguel, 2,600 meters, *Weberbauer 3890.* Cutervo, *Jelski.*—Piura: At 3,000 meters, *Weberbauer 6053.* Río Piura and Nanchó, *Raimondi* (det. Diels).—Libertad: East of the Marañón, *Raimondi* (det. Diels). Chile. "Raral," "andaga," "garo," "shiapash."

3. PANOPSIS Salisb.

Andriapetalum Pohl, Pl. Bras. Icon. 1: 113. 1827.

Shrubs or small trees with entire, often verticillate leaves. Racemes axillary and terminal. Filaments obvious, borne below the middle of the perianth lobes. Disk cupulate, 4-lobed. Fruit a hard, 1-seeded drupe.—The later name of Pohl was accredited to Schott by Endlicher as *Andripetalum.*

Pedicels rigid, 10–12 mm. long, glabrous.....*P. acuminata.*
Pedicels lax, 5–6 mm. long, pubescent.....*P. rubescens.*

Panopsis acuminata (Meisn.) Macbr. Field Mus. Bot. 11: 66. 1931. *Andriapetalum rubescens* Pohl, var. *acuminatum* Meisn. in DC. Prodr. 14: 346. 1856.

Leaves subsessile, oblong-lanceolate, acute to long-acuminate, 2.5–4 cm. wide, finely reticulate-veined on both sides, glabrous; racemes glabrous, the stiff pedicels divaricate; flowers cream-colored. —Perhaps better regarded as a variety of the next. A tree of 8 meters (Klug). Neg. 7445.

Loreto: Mishuyacu, near Iquitos, 100 meters, *Klug 1540.* Brazil.

Panopsis rubescens (Pohl) Pittier, Contr. Fl. Venez. 21. 1923. *Andriapetalum rubescens* Pohl, op. cit. 114. *pl. 91.*

Similar to the above, but the young branchlets, leaves, and racemes rusty-tomentulose; leaves narrowed to both ends, obtusish, glabrous in age, beautifully reticulate-veined and suffused with red from the midnerve.—Flowers pure white, with the odor of vanilla; fruit 4–6 cm. long, 1–1.5 cm. thick, densely tomentose, indehiscent (Ducke). The Peruvian form, var. *simulans* Macbr. Field Mus. Bot. 11: 67. 1931, has acute or acuminate leaves. Neg. 19067.

Loreto: Timbuchi, Río Nanay, *Williams 1044* (type of var. *simulans*). Manfinfa, upper Río Nanay, *Williams 1121.* Brazil; British Guiana.

4. EUPLASSA Salisb.

Pinnately leaved shrubs or trees with racemes or narrow, raceme-like panicles of rather small flowers.—Otherwise like *Panopsis* but perianth oblique in bud, anthers subsessile, and disk entire.

Euplassa Isernii Cuatrecasas, sp. nov.

Ramis ignotis; foliis petiolatis, petiolo 8–9 cm. longo tereti inferne applanato minute puberulento; foliolis 8-jugis breve petiolulatis paullo alternantibus, petiolulo 3–4 mm. longo tereti striato puberulento, oblongo-ellipticis, acuminatis basi late acutis margine repando-serratis vel subintegris 8–12 cm. longis, circa 4 cm. latis, chartaceo-coriaceis conspicue reticulatis utrinque subnitidulis supra viridibus glabris subtus castaneis ad nervum medianum minute sparseque puberulentis; floribus paniculam angustam spurie racemosam referentibus; paniculis cum pedunculo 6 cm. longo 30 cm. longis cum pilis adpressis minutis paullo fulvis parce pubescentibus;

pedicellis ad mediam connatis circa 7 mm. longis; petalis 10 mm. longis; ovario glabro.—Apparently, by reason of its many leaflets and glabrous ovary, very well marked, and the second species west of the Andes, the other being *E. occidentalis* I. M. Johnston of Ecuador, with 4 pairs of obovate leaflets. Included here with Dr. Cuatrecasas' permission, the description supplied by me.

Junín: Chanchamayo, *Isern 2283*, type, Herb. Madrid.

5. **ROUPALA** Aubl.

Stoutly branched shrubs with alternate leaves. Racemes or spikes slender, often more or less tomentose, the rather small flowers often divaricate on short pedicels. Anthers subsessile on the upper part of the perianth lobes.—A fruiting specimen (*Williams 7439*, San Roque) has entire, ovate, long-acuminate, long-petioled leaves exactly simulating those of *R. macropoda* Karst. of Colombia, but the fruits are cylindric, 1 cm. long, 2 mm. thick; in the absence of flowers the generic identity is uncertain. The Aublet name has been written *Rhopala*, *Ropala*, and *Rupala* and, at least by typographical error, still otherwise, using the same letters.

Flowers sessile, the spikes much exceeding the leaves. . . *R. spicata.*

Flowers always more or less pedicellate.

Mature leaves glabrous except the midnerve beneath, the trichomes not distinct, usually forming a gray indument.

Leaves rotund-cordate; pubescence beneath grayish. *R. cordifolia.*

Leaves not cordate, or at least the pubescence not a gray indument.

Leaves simple, at least those of the flowering branchlets.

Leaves rounded-truncate at the base. . . *R. dolichopoda.*

Leaves cuneate at the base or at least acute.

Racemes distinctly pubescent; leaves 3.5–4 cm. wide.

Leaves finally glabrous beneath. . . . *R. complicata.*

Leaves pubescent beneath on the costa. . *R. ferruginea.*

Racemes glabrous; leaves mostly wider. . . . *R. Dielsii.*

Leaves pinnate, but only the sterile branchlets known. *R. Raimondii.*

Mature leaves more or less pubescent beneath, the trichomes distinct, often red or fulvous.

Pubescence red-brown, very dense on the leaf nerves beneath; pedicels often only 1–2 mm. long..... *R. monosperma.*

Pubescence grayish-fulvous, moderate; pedicels 3–5 mm. long. *R. pinnata.*

Roupala complicata HBK. Nov. Gen. & Sp. 2: 153. *pl. 119.* 1817.

A slender shrub or tree with thick, subglabrous, glaucescent leaves and pallidly rusty-tomentose racemes that about equal them; leaf blades entire or remotely and obtusely few-dentate, decurrent into the petiole, this 2–3 cm. long; leaf nerves more or less elevated or subimmersed, the veins obscurely and laxly reticulate; racemes about 10 cm. long; pedicels 2–3 mm. long; ovary rusty-tomentose; stigma scarcely clavate.—Variable; the specimens by Killip and Smith were determined by the latter as *R. Gardneri* Meisn., a form typically of interior Brazil with more elevated leaf nervation. See Field Mus. Bot. 11: 66. 1931. Neg. 11749.

San Martín: Morales, Alto Río Huallaga, 900 meters, *Williams 5703.* Zepelacio, 1,100 meters, *Klug 3742;* a tree of 4 meters, the flowers light yellow. San Roque, 1,400 meters, *Williams 7439.* Moyobamba, 800 meters, *Weberbauer 4480;* 290.—Junín: Chanchamayo Valley, 1,200 meters, *Schunke 426; Isern 2327.* San Ramón, 900–1,300 meters, *Killip & Smith 24782, 24891.* Río Perené, 600 meters, in forest, *Killip & Smith 25114;* a slender shrub of 1.5–2 meters; flowers creamy white. Colonia Perené, 680 meters, *Killip & Smith 25035.*—Loreto: Along the Río Ucayali, *Tessmann 3431.*—Cuzco: Santa Ana, 800 meters, *Weberbauer 5024;* also Urubamba (280). North to the Guianas and Costa Rica. "Ingaina," "arellán."

Roupala cordifolia HBK. Nov. Gen. & Sp. 2: 152. *pl. 118.* 1817.

Much branched, the branchlets glabrous; petioles to 2.5 cm. long; leaves to about 10 cm. long, remotely and coarsely dentate or subentire, fleshy-coriaceous, soon glabrous, the laxly reticulate veins subimmersed; racemes reddish-pubescent, very much longer than the leaves; flowers 8–10 mm. long, white, the slender, rusty-tomentose pedicels 2–3 times longer; stigma clavate.

Cajamarca: Jaén de Bracamoros (*Humboldt,* type). Huambos, *Weberbauer 4192.* Ecuador; Colombia.

Roupala Dielsii Macbr. Field Mus. Bot. 11: 65. 1931.

A glabrous shrub with slender, few-branched, densely leafy branchlets; leaves elliptic-oblong or somewhat obovate, basally

attenuate to the (3–5 mm. long) petiole, shortly and broadly acuminate, 10 cm. long, 4 cm. broad, somewhat lustrous above but scarcely veiny, opaque beneath, the lateral veins elevated but obscurely reticulate, finally subcoriaceous, entire below but more or less denticulate above the middle; racemes with flowers about 2 cm. wide, as long as the leaves, glabrous or glabrescent, only the ovary reddish-tomentose; flowers 3.5 mm. long, a little longer than the pedicels; style 6 mm. long, the stigma distinctly clavate.

Loreto: Río Itaya, *Williams 114* (type).

Roupala dolichopoda Diels, Bot. Jahrb. 54: Beibl. 117: 35. 1916.

A shrub of 2 meters; petioles 4–9.5 cm. long, slightly pilose basally; leaves coriaceous, finally glabrous, ovate, short-acuminate, nearly truncate at the base, appressed callous-serrate, 10–15 cm. long, 6.5–11 cm. wide; racemes sessile, rusty-pilose, becoming glabrate, about 10 cm. long; pedicels 1.5–2.5 cm. long; perianth yellowish, rusty-pilose, 7–8 mm. long; ovary rusty-tomentose, the glabrous style obovate apically.—Allied by the author with *R. complicata*. Neg. 11752.

Piura: Above Ayavaca, 1,700 meters, *Weberbauer 6364* (type).

Roupala ferruginea HBK. Nov. Gen. & Sp. 2: 152. 1817.

Apparently too near *R. complicata* HBK., but the leaves obovate-oblong, entire, the costa beneath pubescent, even in age, otherwise glabrous, reticulate-veined, about 7 cm. long; stigma clavate.—A shrub of 2 meters.

Huánuco: Mito, 2,550 meters, *3447* (det. Johnston).—Cajamarca(?): Chamay, Bracamoros (*Humboldt*, type).

Roupala monosperma (R. & P.) I. M. Johnston, Contr. Gray Herb. 73: 42. 1924. *Embothrium monospermum* R. & P. Fl. 1: 63. *pl. 98*. 1798. *R. peruviana* R. Br. Trans. Linn. Soc. 10: 192. 1811.

Branchlet tips, leaves, especially beneath, and racemes densely pubescent with a more or less evanescent, nearly bright red or red-brown tomentum; petioles 2–2.5 cm. long; leaf blades glabrous above in age, obscurely toothed, somewhat obliquely elliptic, shortly acute at both ends, finally about 10 cm. long and 6 cm. wide; racemes 10 cm. long; pedicels 1–2 mm. long; flowers glabrate, 6 mm. long, the tube about three times longer than the limb; fruit 3 cm. long, long-necked at the base, acute.—Flowers greenish yellow or yellow (Weberbauer). *R. Varelana* Diels (named for the Director of the

Madrid Bot. Garden), from Ecuador by Ruiz and Pavón, differs in its smaller, oblong-oval leaves and congested racemes, 3–5 cm. long. Negs. 11759, 27824.

Junín: Huacapistana, 2,000 meters, *Weberbauer 2168;* 246. Mantaro Valley, 2,500 meters, *Weberbauer 6587.*—Huánuco: Pampayacu, *Sawada P. 28.* Near Panao, *Ruiz & Pavón.* "Paco-paco de la sierra."

Roupala pinnata (R. & P.) Diels in herb., comb. nov. *Embothrium pinnatum* R. & P. Fl. 1: 163. *pl. 97.* 1798. *R. diversifolia* R. Br. Trans. Linn. Soc. 10: 193. 1810.

Branchlets, racemes, and younger leaves beneath more or less rusty-tomentose; petioles 1.5 cm. long, rarely 2.5 cm.; leaves of young shoots more or less coarsely serrate or lobed or even pinnate, these with 5 pairs of leaflets, softly pubescent on both sides, strongly oblique, the twice larger terminal one to 8 cm. long and 4 cm. wide; normal leaves coarsely serrate, oval or roundish, almost equally attenuate at the base, sharply acute or cuspidately acuminate, about 6 cm. long and 4 cm. wide, lustrous above; racemes 10 cm. long; pedicels 3–5 mm. long; fruits short-necked at the base, acute, 2.5 cm. long.—A compact tree of 5 meters (my specimen) with creamy white flowers. Bark fetid (Ruiz & Pavón). Leaves of the Jelski specimen very heavy, nearly round. Negs. 11765, 27822.

Huánuco: Muña, *Ruiz & Pavón;* at 2,100 meters, *3948.* Posuso, 1,200 meters, *Weberbauer 6777.*—Cajamarca: Cutervo, *Jelski 97*(?). "Paco-paco."

Roupala Raimondii Macbr. Field Mus. Bot. 11: 65. 1931.

Glabrous except the slender, densely leafy branchlet tips, these evanescently reddish-pubescent; petioles to 4 cm. long; leaves finally 20–25 cm. long, the 4–7 pairs of ovate-lanceolate leaflets strongly unequal at the entire, cuneate base, medially spinescent-serrate, apically entire, long-acuminate, to 14 cm. long and 4 cm. wide, often smaller or the terminal a little larger; veins and veinlets obscurely and laxly reticulate on both sides; upper leaf surface slightly lustrous, the lower opaque, reddish; teeth mostly 4 mm. long, 2.5 mm. broad at the base, a few larger, all straight or nearly so, apiculate, the sinus acute.—Type sterile and possibly, but not at all certainly, the juvenile leaves of *R. complicata* or some other species, but those of *R. complicata* (rarely pinnate) are not at all spinescent-serrate, the teeth short. Neg. 11786.

San Martín: Crown of sierras, Tarapoto, 750 meters, *Williams 5997* (type). Between Moyobamba and Tarapoto, *Raimondi.*

Roupala spicata Baehni, sp. nov.

Frutex vel arbor; ramuli petiolique leviter puberulo-tomentosi. Laminae (in sicco conduplicatae) ovatae, basi et apice acutae, margine indistincte dentatae, supra glabrescentes, subtus puberulae. Spicae axillares, ferrugineo-pilosae. Flores sessiles; sepala semper ad basin libera et medio coalescentia; antherae filamenta brevia; stylus glaber apice clavatus, ovarium uniloculare (semina 2) lanatum, glandulae hypogynae 4, liberae.—Petioli 1.5–2.5 cm. longi; laminae 4–5 cm. latae, 5–6 cm. longae. Perianthium 8 mm. longum. Neg. 29570.

Branches, petioles, and leaves beneath lightly puberulent-tomentose; petiole 1.5–2.5 cm. long; leaf blades broadly ovate, shortly acute at base and apex, obscurely dentate, 4–5 cm. broad, 5–6 cm. long; spikes rusty-pilose, 2–3 times longer than the leaves; perianth segments coalescent at the middle, 8 mm. long; anthers subsessile; style clavate.—Dr. Charles Baehni of the Conservatoire Botanique, Geneva, has studied this plant, which had been determined, obviously in error, as *R. cordifolia* HBK. with pedicellate flowers (as all other species!).

Cajamarca: Huambos, 2,300–2,500 meters, *Weberbauer 4192,* type in Cons. Bot. Geneva.

51. LORANTHACEAE. Mistletoe Family

Reference: Engler & Krause, Pflanzenfam. ed. 2. 16b: 98–203. 1935.

Traditionally known for the romantically and economically important mistletoe, this family in recent times has acquired additional interest in the discovery that it contains a drug that affects blood pressure (see Gautier, Semaine Médicale 513. 1907) and rubber in important quantities, this from several members including Peruvian species (see Warburg, Tropenpflanzer 9: 633. 1905 and Engler & Krause, op. cit. 131 for additional references on both these subjects). Many of the Peruvian species, notably in the genera *Phrygilanthus, Psittacanthus,* and *Gaiadendron,* supply in flower brilliant patches of color in the green mass of vegetation along forest trails or river banks open to the sun.

The family is very closely knit. The forms with a calyx or calyculus have been sorted into two groups, one comprising those with a 1-celled ovary, the other those with the ovary 2–several-celled. The segregation of these main divisions is based principally

on the presence or absence of endosperm in the seed, supplemented by stamen characters. These characters occur in both Old and New World forms and, significantly, are not associated concomitantly or with other diagnostic features, not repetitive in some other combination. It may be questioned, therefore, whether they show a common origin and indicate a natural relationship; the genera resulting do not suggest it. Perhaps there have been similar parallel developments affording different combinations of the same characters in this very homogeneous family. However this may be, it seems possible to recognize the recently accepted genera so far as Peruvian species are concerned, but if one were to include the genus *Loranthus* L., only since Eichler restricted to the Old World, it would be apparent that only the presence of endosperm distinguishes the Peruvian group *Aetanthus;* if this establishes correctly a precedent, taxonomy of a family may be chiefly chemical. As a practical matter and as a matter of fact(!), there is a single highly natural genus, *Loranthus* L., world-wide in distribution, divisible into sections that may indicate the theoretical relationship of the species and groups of species. Those who believe that the presence or absence of endosperm is fundamental may thus express their judgment without depriving the phytogeographer, ecologist, pharmacist, traveler, to mention a few other than the professional taxonomist, of a group name for a group obviously and reasonably self-contained in nature. The extremes to which segregation must be carried logically have been shown recently by Danser. It is noteworthy that the segregate genera have been maintained mostly on characters, such as endosperm and ovary cells, completely different from those on which their authors founded them.

In the following treatment the receptacle and its more or less developed edge are called the calyx, for which there is good precedent, inasmuch as it is unknown whether the edge of this structure is a reduced calyx or the edge of the blossom axil (receptacle); cf. Engler & Krause, op. cit. 119. It may be remarked that those who use the word calyculus for this edge, in practice nearly always apply the name to the entire structure, as evidenced in giving the length; the term calyx, therefore, will be understood by everyone. The bracteal development that results in a cupula, so called, more or less enclosing the calyx and ovary, is mentioned here simply as cup.

Flowers minute, more or less immersed in a fleshy rachis or borne in axillary clusters and strobiles, then sometimes tiny; calyx obsolete, except more or less evident in *Oryctanthus*.

Flowers clustered and strobilate.

Leaves alternate.

Filaments elongate, free.....1. *Antidaphne.*

Filaments short, mostly united to the perianth segments.
2. *Eremolepis.*

Leaves opposite.....3. *Lepidoceras.*

Flowers spicate.

Flower parts 3; calyx wanting; spikes articulate.

Anther cells confluent, 1-pored; leaves often small or wanting.
4. *Dendrophthora.*

Anthers 2-celled, dehiscing longitudinally; leaves well developed.....5. *Phorandendron.*

Flower parts 6; calyx present; spikes not articulate.
6. *Oryctanthus.*

Flowers small to very large, or rarely tiny but never inserted in the rachis; calyx present.

Anthers basifixed; ovary 1-celled; endosperm lacking.
7. *Aetanthus.*

Anthers versatile; ovary 1–several-celled.

Ovary 2–several-celled; endosperm ruminate; leaves more or less punctate beneath; flowers in 3's, each calyx subtended by a persistent, spreading bractlet.....8. *Gaiadendron.*

Ovary 1-celled; characters other than above, at least in part.

Flowers showy, usually 1 cm. long to much longer.

Endosperm present; calyx not enclosed in a cup but if obviously bracteolate (bractlets often promptly caducous or minute), the bractlet sometimes foliaceous but the flowers then not ternate...9. *Phrygilanthus.*

Endosperm lacking; each calyx more or less enclosed in a cup, this sometimes shallow, or the calyces, borne in 3's, often subtended by one concave bractlet, this sometimes foliaceous.....10. *Psittacanthus.*

Flowers small, rarely 6 mm. long.

Crowded inflorescences basally white-bracteolate.
11. *Peristethium.*

Open or simple inflorescences not white-bracteolate.
12. *Struthanthus.*

1. ANTIDAPHNE P. & E.

A small shrub with alternate, roundish-obovate leaves and small, clustered, strobile-like spikes, their imbricate bracts caducous at anthesis. Staminate flowers apetalous; perianth segments of the pistillate flower 3.—The Peruvian species grows especially on Lauraceae.

Antidaphne viscoidea P. & E. Nov. Gen. & Sp. 2: 70. *pl. 199.* 1838.

Leaves on flowering branchlets obovate, about 5 cm. long, 3 cm. wide, the terminal and those on older branches rotund-obovate, to 6 cm. wide and 9 cm. long, the reticulate venation prominent; flowers cream-colored.—Weberbauer found it between 2,700 and 3,000 meters. Neg. 11822.

Cajamarca: San Miguel, *Weberbauer 3929;* 258. Chugur, *Weberbauer 4099;* 259.—San Martín: Zepelacio, 1,200–1,600 meters, *Klug 3594.*—Huánuco: Cochero and Pampayacu, *Poeppig 1308.* Bolivia to Colombia.

2. EREMOLEPIS Griseb.

Shrubs allied to *Antidaphne,* but the perianth segments often 4 and present also in the staminate flowers. Leaves 3–5-nerved.—No Peruvian specimens found cited, but in the *Pflanzenfamilien* it is stated that there are 6 species in "Chile, Peru, Brazil, and Cuba." Perhaps most to be expected is

Eremolepis punctulata (Clos) Griseb. emend. Benth. in Benth. & Hook. f. Gen. Pl. 3: 215. 1880. *Lepidoceras punctulata* Clos in Gay, Fl. Chile 3: 165. 1847.

Pistillate and staminate flowers on separate plants; perianth segments deciduous from the fruit.—*E. Schottii* (Eichl.) Engler has the two sorts of flowers on different branches of the same shrub and perianth segments persistent; *E. Glazioui* (van Tiegh.) Engler has both sorts of flowers together, the perianth segments concrete with the pistil, and fruits borne at the base of short, leafy branchlets.

Peru: (Possibly). Chile.

3. LEPIDOCERAS Hook. f.

Much branched shrubs with opposite leaves and axillary racemes, the tiny flowers dioecious. Unlike the two preceding related genera, the seeds are without endosperm.—Grows on Myrtaceae. Authoritatively (see Pflanzenfam.) but surely not unquestionably Peruvian.

Lepidoceras Dombeyi Hook. f. Fl. Ant. 2: 293. 1846.

Branches very slender; leaves elliptic-obovate, typically sharply apiculate; staminate flowers closely bracteate, the pistillate bracts soon foliaceous.—*Isern 2136*, "Chanchamayo," but without original label, the leaves obtuse or mucronulate, is *L. Kingii* Hook. f. As Chanchamayo, Peru, is a region totally different phytogeographically from the known range of the genus, the Isern locality is almost surely an error.

4. **DENDROPHTHORA** Eichl.

Leafy plants, similar in appearance to *Phoradendron*, from which they must be distinguished as indicated in the key, except that in general they are less robust or smaller, with the flowers in single rows on each side of the rachis.

Leaves developed.
- Leaves mostly or all of them 2 cm. long or longer.
  - Petioles obvious.
    - Leaves 4–6 cm. long.
      - Petioles 1–2 cm. long; pistillate spikes 4–5 cm. long. *D. leucocarpa.*
      - Petioles 1 cm. long; pistillate spikes 2 cm. long. . *D. nodosa.*
    - Leaves 1.5–4 cm. long.
      - Internodes terete; staminate flowers 50–100. *D. hexasticha.*
      - Internodes (upper) compressed; staminate flowers rarely 60.
        - Dioecious; petioles 5–12 mm. long. . . . *D. chrysostachya.*
        - Monoecious; petioles 1.5–2.5 mm. long. . . . . *D. clavata.*
  - Petioles lacking; leaves linear . . . . . *D. linearifolia.*
- Leaves, or at least most of them, 1.5 cm. long or shorter.
  - Petioles obvious.
    - Leaves acuminate; flowers monoecious. . . . . *D. Negeriana.*
    - Leaves obtuse; flowers dioecious.
      - Leaves linear-spatulate. . . . . *D. Urbaniana.*
      - Leaves obovate-orbicular. . . . . *D. crassuloides.*
  - Petioles obsolete.
    - Leaves 6–14 mm. long, nerveless.
      - Leaves 6–10 (15) mm. long; spikes pistillate above, staminate below. . . . . *D. mesembryanthemifolia.*

Leaves 8–14 mm. long; spikes entirely staminate. *D. ferruginea.*

Leaves 5 mm. long, the lateral nerves obvious on both sides. *D. ramosa.*

Leaves wanting or reduced to scales.

Branches terete or quadrate; flowers 4-seriate..*D. fasciculata.*

Branches complanate; flowers 2-seriate.....*D. Pavoni.*

Dendrophthora chrysostachya (Presl) Urban, Ber. Deutsch. Bot. Ges. 14: 285. 1896; 68. *Viscum chrysostachyum* Presl, Epim. Bot. 254. 1849. *V. globuliflorum* Presl, op. cit. 134. *Phoradendron chrysostachyum* Eichl. in Mart. Fl. Bras. 5, pt. 2: 107. 1868.

Dioecious; internodes 2–5 cm. long; petioles 1.5–2.5 mm. long; leaves elliptic-oblong, obtuse, narrowed at the base, 2–4 cm. long, 7–20 mm. broad, basally 3–5-nerved; staminate spikes pedunculate, 4–7 mm. long; fruit globose, nearly smooth.

Huánuco: (*Haenke*). Muña, 2,100 meters, *3950*. Vilcabamba, 1,800 meters, *5135*.

Dendrophthora clavata (Benth.) Urban, Ber. Deutsch. Bot. Ges. 14: 285. 1896. *Viscum clavatum* Benth. Pl. Hartw. 189. 1845. *Phoradendron clavatum* Eichl. in Mart. Fl. Bras. 5, pt. 2: 107. 1868.

Allied to *D. crassuloides* but monoecious; leaves 1.5–4 cm. long, 7–20 mm. wide; peduncles 5–15 mm. long; flowers 6–7-seriate in 1–3-jointed spikes 0.5–2 cm. long, the lower staminate joint 24–66-flowered, the upper pistillate 18–42-flowered.—Apparently not collected in Peru, but certainly occurring there. Neg. 29151.

Peru: (Probably). Bolivia to Ecuador and Venezuela.

Dendrophthora crassuloides (Presl) Urban, Ber. Deutsch. Bot. Ges. 14: 285. 1896; 62. *Viscum crassuloides* Presl, Epim. Bot. 252. 1849. *Phoradendron crassuloides* Eichl. in Mart. Fl. Bras. 5, pt. 2: 107. 1868.

Internodes soon terete, very shortly pilose, 2.5–5 cm. long; petioles 3–5 mm. long; leaves rounded at the apex, gradually narrowed to the petiole, 1–1.5 cm. long, nearly as broad, basally inconspicuously 3–5-nerved; pistillate spikes to 1 cm. long, 1–2-articulate, the 4–8 flowers 4–5-seriate; peduncles 4–10 mm. long.—Closely allied is *D. portulacoides* (Presl) Urban, with subcordate leaves and staminate spikes with 50–120 flowers in each joint, about 10-seriate.

Huánuco: (*Haenke*).—Puno: Sandía, *Weberbauer 737, 6124;* 240.

Dendrophthora fasciculata Patsch. Bot. Jahrb. 45: 441. 1911.

Densely and fasciculately branched; spikes fasciculate, 4–5 cm. long, 5–7-articulate, the superior flowers often staminate, the lower pistillate, 8–12 in each joint; fruit white, to 1 cm. long, 3 mm. thick.—On *Euphorbia.*

Ancash: Prov. Huari, 2,700–2,800 meters, *Weberbauer 3300* (type).

Dendrophthora ferruginea Patsch. Bot. Jahrb. 45: 441. 1911.

A slender, branching shrub, the internodes 2–2.5 cm. long; leaves linear, acuminate, 2 mm. wide; spikes solitary, 3–9 mm. long, 1–2-articulate, the peduncle 5 mm. long; flowers dioecious, ferruginous, 4-seriate, about 20 in each joint.

Huánuco: Monzón, 3,300–3,500 meters, *Weberbauer 3382* (type).

Dendrophthora hexasticha van Tiegh. Bull. Soc. Bot. France 43: 182. 1896; 67.

Similar to *D. chrysostachya;* young branchlets papillose-scabrous; petioles 3–10 mm. long; staminate spikes with 3–4 joints, the lower 6-seriate, sometimes 10-seriate, with 50–100 flowers, the pistillate 2–3-articulate, 6-seriate, the flowers 20–36.—On *Vaccinium.* Neg. 29152.

Puno: Tabina, *Lechler 1927.*—Without locality: *Dombey.*

Dendrophthora leucocarpa (Patsch.) Trel. Gen. Phor. 218. 1916. *Phoradendron leucocarpum* Patsch. Bot. Jahrb. 45: 438. 1911.

A papillose-scabrous shrub, similar to *D. nodosa;* internodes 3–5 cm. long; leaves 2–2.5 cm. broad; pistillate spikes 5–7-jointed, each joint 30–34-flowered. Neg. 18189.

Junín: Huacapistana, 2,500–3,100 meters, *Weberbauer 2193, 2439.*

Dendrophthora linearifolia Patsch. Bot. Jahrb. 45: 440. 1911.

Glabrous, the branches terete or somewhat angled, the internodes 3 cm. long; leaves obtuse, 3–5.5 cm. long, 4 mm. broad; spikes solitary, sessile, not articulate, 5 mm. long, the upper flowers staminate, the lower pistillate, 4-seriate; fruit white, 5 mm. long, 3 mm. thick.—On *Croton.*

Puno: Sandía, at 2,100–2,300 meters, *Weberbauer 539* (type); 238.

Dendrophthora mesembryanthemifolia Urban, Ber; Deutsch. Bot. Ges. 14: 285. 1896; 70.

Monoecious, the younger branches definitely striate-pilose and, like the leaf margins, minutely papillose-pilose; leaves oblong- or

linear-spatulate, the tip acute, recurved or obtuse and mucronulate, gradually narrowed to the base, 1–3 mm. broad; spikes mostly 2-jointed, the joints 3–12 mm. long, 6-seriate, 8–50-flowered.—On *Salvia*.

Cuzco: Valle del Apurímac, *Herrera*. Cuyocuyo, *Weberbauer 868* (det. Patschovsky). Pillahuata, 2,800 meters, *Pennell 14098*. Mollepata, *Herrera 1228* (det. Patschovsky).—Puno: Agapata, *Lechler 1893*.—Ayacucho: Totorabamba, 3,500 meters, *Weberbauer 5465*.—Huánuco: Tambo de Vaca, 3,900 meters, *4383*. Mito, 2,700 meters, *1606*. Cani, 2,550 meters, *3477*.

Dendrophthora Negeriana Patsch. Bot. Jahrb. 45: 440. 1911.

A slender shrub, the younger branches compressed, somewhat scabrous, the internodes 3 cm. long; leaves lance-ovate, narrowed to the (2 mm. long) petiole, 8–15 mm. long, 3–5 mm. broad; spikes long-peduncled, solitary, 2–5 cm. long, 3-articulate, the flowers in each spike ferruginous, 2-seriate, 2–8 in each joint.

Junín: Huacapistana, 2,500 meters, *Weberbauer 2138* (type).

Dendrophthora nodosa Patsch. Bot. Jahrb. 45: 439. 1911.

Branches slender, papillose-scabrous, the internodes 2–2.5 cm. long; leaves lanceolate, obtuse, narrowed to the petiole, prominently nerved, 1–2 cm. broad; spikes solitary, the very slender staminate ones 4 cm. long, 3-articulate, on a peduncle 6 mm. long; flowers dioecious, 6-seriate, about 42 to each joint; pistillate spikes 2-articulate, the 2–5-seriate flowers 4–15 in each joint.

Puno: Toward Chunchosmayo, 1,800–2,600 meters, *Weberbauer 1078* (type).

Dendrophthora Pavoni van Tiegh. Bull. Soc. Bot. France 43: 182. 1896; 71.

Leafless; flowers 1–2-seriate.—Allied by the author to *D. Mancinellae* Eichl. of Cuba. *D. Poeppigii* van Tiegh., of the upper Amazon, is monoecious, the 2–5-jointed spikes staminate above, pistillate below, the lower joint 4–6-flowered.

Peru, the locality unknown.

Dendrophthora ramosa Patsch. Bot. Jahrb. 45: 440. 1911.

A strongly branched shrub, the internodes 2 cm. long; leaves spatulate, narrowed toward the tip, 2 mm. wide; spikes solitary, the peduncle 10–13 mm. long, with 1 or rarely 2 joints 10–27 mm. long; staminate flowers ferruginous, 4-seriate, 40–82 on each joint.

Huánuco: Near Monzón, 3,400 meters, *Weberbauer 3369* (type).

Dendrophthora Urbaniana Patsch. Bot. Jahrb. 45: 440. 1911.

A slender, much branched, often pilose shrub, drying yellow; branches terete, the internodes 2–3.5 cm. long; leaves 8–14 mm. long, 3 mm. broad, rarely pilose, finely nerved, narrowed to the (3 mm. long) petiole; spikes mostly solitary, the staminate 1–2 cm. long, the 2-seriate flowers 12–18 in the 1–2 joints; peduncle 3–5 mm. long; pistillate spikes 7 mm. long, each joint 4-flowered; fruit globose, drying yellow, plicate-rugose, 4 mm. long, 3 mm. thick. Neg. 27825.

Amazonas: Near Chachapoyas, 2,400 meters, *Weberbauer 4404, 4388;* 263.

5. PHORADENDRON Nutt.

Reference: Trelease, Gen. Phorad. 1916.

The key characters may serve to identify this well known genus. It contains species that are harmful on account of their parasitic habit on useful plants, notably in the Amazonian region on plantations of young *Hevea* rubber trees (Warburg). The following compilation is almost wholly drawn from the monograph by Trelease. Three new species by him, kindly communicated by Mr. Ellsworth P. Killip, are included, for which I have supplied Latin diagnoses.

Scales present only on the basal joint of each branch.

Leaves 2–5 mm. wide, 1–3 cm. long.

Leaves 3 cm. long, 3-nerved ..... *P. Ernestianum.*

Leaves 1 cm. long, enervose ..... *P. virgatum.*

Leaves about 1 cm. wide, 12–13 cm. long ..... *P. angustifolium.*

Leaves much broader.

Leaves basinerved.

Nerves fine; leaves rather thin ..... *P. semiteres.*

Nerves coarse; leaves fleshy ..... *P. obliqua.*

Leaves pinnately nerved.

Spikes scarcely 2 cm. long, very slender ..... *P. Mathewsii.*

Spikes mostly longer, in any case rather stout.

Spikes clustered, at least at some nodes .. *P. Englerianum.*

Spikes solitary ..... *P. peruvianum.*

Scales present on all nodes.

Stems continuous or prevailingly not branching at all nodes; flowers in 4–10 series.

Leaves obscurely pinnate-veined beneath; flowers 4(–6). *P. piperoides.*

Leaves basinerved; flowers in (4–) 6 or more series.

Flowers in 6 or fewer series, the spikes 2–5 cm. long.

Spikes often clustered; leaves rather obscurely nerved.

Leaves broadly elliptic, 3–10 cm. wide; scales several. *P. crassifolium.*

Leaves nearly orbicular, 7–12 cm. wide; scales a single pair. *P. Albert-Smithii.*

Spikes mostly or all solitary; leaves heavily nerved beneath.

Scales a solitary pair; leaves 5–7 cm. wide. *P. Urbanianum.*

Scales several; leaves 3–5.5 cm. wide... *P. ayacuchanum.*

Flowers in 8(6)–10 series, the spikes about 6 cm. long.

Leaf nerves obvious at the base; scales about 1 cm. above the node..... *P. Lindavianum.*

Leaf nerves completely lacking; scales nodal. *P. Macbridei.*

Stems normally forking at each node; flowers in 2–4 series; leaves basally nerved..... *P. huallagense.*

Phoradendron Albert-Smithii Trelease, sp. nov.

Internodiis gracilibus, 3–4 mm. crassis, 15 cm. longis, teretibus; vaginis cataphyllaribus 2 ad omnia internodia, paullo supra basin abeuntibus; foliis 7–12 cm. latis fere rotundatis, ad basin longe (1 cm.) angustatis, vix coriaceis basinerviis, nervis tenuibus; spicis plerumque 3–5.3 cm. longis, 5-articulatis; floribus circa 22 in quovis articulo in seriebus 4 (2)–6 dispositis.—Aequatoriales-Percurrentes.

Glabrous, the long, slender internodes 3–4 mm. thick, 15 cm. long, terete, with an annular pair of cataphylls shortly above the base of each; leaves 7–12 cm. broad, drying rather thin, dull green and finely basinerved on both sides, cuneately tapered at the base for about 1 cm.; spikes yellow, before flowering 3 cm. long, with about 5 joints, these about 22-flowered, the flowers in 4 (2) or 6 series.

Ayacucho: Aina, 750–1,000 meters (*Killip & Smith 11598;* type in U. S. Nat. Herb.).

Phoradendron angustifolium (HBK.) Eichl. in Mart. Fl. Bras. 5, pt. 2: 115. 1868; 65. *Loranthus angustifolius* HBK. Nov. Gen. & Sp. 3: 442. 1820.

Not forked, the rather thin, basally finely nerved leaves about 10 cm. long; scales a single pair 5–10 mm. above the base of the joint, spreading; spikes somewhat clustered, 2 cm. long, slender, with 3–6 oblong joints, these 30–40-flowered, the pistillate flowers in about 4 series; peduncle 4–6 mm. long, the scales narrowly white-margined; fruit 4 cm. thick, smooth, the sepals inflexed.—Allied is *P. parietioides* Trel., to which *Tessmann 4880* from the Marañón may possibly belong; it has somewhat falcate, finely nerved, veiny leaves 1.5–2 cm. wide; fruit ellipsoid, 3 mm. thick, 4.5 mm. long, the sepals spreading. Illustrated, Trelease *pl. 79.*

Cajamarca(?): Olleras to Mt. Aipate (*Bonpland 3508*).—Without locality: *Pavón* (scales ciliate; pistillate spikes 30 mm. long, about 12-flowered at the end of the joint). Bolivia.

Phoradendron ayacuchanum Trelease, sp. nov.

Internodiis 3–4 mm. latis 13 cm. longis teretibus sed versus nodos paullo dilatatis; vaginis cataphyllaribus ad omnia internodia, 2 ad infimum internodium tantum obviis, 3 vel 4 alteris supra basin insertis; foliis falcato-lanceolatis, basi apiceque cuneato-angustatis, obtusis, 3–5.5 cm. latis, 15–17 cm. longis, nervis e basi conspicuis; spicis plerumque solitariis 2 cm. longis 4–5-articulatis, floribus 4-seriatis circa 10 in quovis articulo; perianthio clauso.—Aequatoriales-Crassifoliae.

Glabrous, dark green, the leaves drying coriaceous and dull brown; internodes 3–4 mm. thick, 13 cm. long or longer, terete except at the slightly flattened nodes; cataphylls a sterile basal pair and 3 or 4 subequally spaced, fertile pairs between each 2 leaf nodes, broad and pointed; leaves falcately lanceolate, gradually blunt-acuminate, 15–17 cm. long, cuneately subsessile, heavily basinerved; spikes subsolitary, 2 cm. long, with 4 or 5 round-turbinate joints, these about 10-flowered, the flowers in 4 (2) series; sepals closed.

Ayacucho: Aina, 750–1,000 meters (*Killip & Smith 22713;* type in U. S. Nat. Herb.).

Phoradendron crassifolium Eichl. in Mart. Fl. Bras. 5, pt. 2: 125. *pl. 48.* 1868; 144.

Occasionally pseudodichotomous; scales several pairs, only the upper (often soon deciduous) fertile; leaves very thick and dull, more or less lanceolately or elliptically ovate, obtuse or bluntly pointed, 3–10 cm. wide, 8–16 cm. long, rounded or attenuate at the base; spikes occasionally forming a compound, terminal inflorescence;

joints about 5, scarcely 10-flowered; peduncle 5 mm. long, often with several pairs of crowded scales; fruit yellowish, slightly granular, 4 mm. thick, the sepals closely inflexed.—The Mathews specimen is ascribed by Trelease to "Martens," presumably an error. Illustrated, Trelease *pl. 213–214.*

San Martín: Tarapoto, *Williams 6126, 6588.* Moyobamba (*Mathews 1622;* leaves 9 cm. wide, 16 cm. long, acuminate).—Junín: Chanchamayo Valley, 1,500 meters, *Schunke 215.* La Merced, 600 meters, *5531; Weberbauer 1860;* 283.—Cuzco: Valle de Santa Ana, *Herrera 992.*—Loreto: Mishuyacu, 100 meters, *Klug 420, 42.* Bolivia to Central America and the West Indies.

Phoradendron Englerianum Patsch. Bot. Jahrb. 45: 439. 1911; 133.

Similar to *P. peruvianum,* the internodes sometimes somewhat quadrangular; scales often 2 or even 3 pairs, within 10 mm. of the base; leaves 2.5–6 cm. wide, 9–15 cm. long, cuneate to the petiole, this 5 cm. long; spikes more or less clustered, subsessile.—Illustrated, Trelease *pl. 196.*

Junín: Tarma, *Weberbauer 1903, 1904;* 283.

Phoradendron Ernestianum Patsch. Bot. Jahrb. 45: 439. 1911; 121.

Somewhat pseudodichotomous, the upper internodes rhombically 4-angled; scales a single pair, nearly basal; leaves lanceolate, acute, 3-nerved, cuneately subsessile; spikes mostly solitary, subsessile, 10–25 mm. long, the 3–5 rounded joints about 6-flowered, the flowers in about 4 series; scales scarcely ciliate; fruit granular, nearly 3 mm. thick, the erect sepals separated.—Illustrated, Trelease *pl. 177.*

Cajamarca: Balsas to Celedín, *Weberbauer 4251.*

Phoradendron huallagense Ule, Verh. Bot. Ver. Brandenb. 48: 158. 1906; 155.

Cymosely dichotomous; scales a solitary, nearly basal pair; leaves ovate, lustrous, mucronate, acuminate to very obtuse, 2–2.5 cm. wide, 5–6 cm. long, cuneately subsessile; spikes solitary, 1 to finally 3 cm. long, with about 4 short, 4-flowered joints; peduncle scarcely 2 cm. long; fruit white, granular, roughened, 2 mm. thick, 4 mm. long, the slightly parted sepals erect.—Illustrated, Trelease *pl. 267.*

Loreto: Huallaga, *Ule 6664*, type. Mishuyacu, 100 meters, *Klug 1123*. Florida, 180 meters, *Klug 2175*. "Beguefide" (Huitoto name).

Phoradendron Lindavianum Patsch. Bot. Jahrb. 45: 438. 1911; 155.

Not dichotomous or scarcely so, the long, thick branches somewhat flattened below the nodes, the elliptic-ovate leaves drying golden yellow; scales one pair, sharply deltoid, keeled, borne about 1 cm. above the base of the joint; leaves more or less mucronate, obtuse to emarginate, 4–9 cm. wide, 10–15 cm. long, decurrent on the petiole, this 10 mm. long; joints about 4, often over 100-flowered, the granular peduncle 5–10 mm. long; fruit (immature) 3 mm. thick, 5 mm. long, the sepals closely inflexed.—Illustrated, Trelease *pl. 235*.

Puno: On *Aralia, Weberbauer 1288* (type).—Huánuco: Cochero, *Poeppig*.

Phoradendron Macbridei Standl., sp. nov.

Rami crassissimi subcompressi, internodiis valde elongatis infra nodos dilatatis, cataphyllis ad basin internodii infimi tantum insertis; folia magna crassissima, petiolis crassissimis vix ultra 6 mm. longis; lamina oblonga vel oblanceolato-oblonga 8–15 cm. longa 3.5–7 cm. lata, apice late rotundata vel breviter emarginata, basi acuta vel basin versus sensim angustata, utrinque profunde dense rugulosa; spicae solitariae sessiles circa 4 cm. longae crassae, nodis circa 6, floribus numerosis circa hexastichis.—Berries white.

Huánuco: Muña, 2,100 meters, *Macbride 3954* (type in Herb. Field Mus.).

Phoradendron Mathewsi Trelease, Gen. Phorad. 133. 1916.

Allied to *P. peruvianum*, and similar; leaves somewhat obliquely elliptic-lanceolate, 2–4 cm. wide, 16 cm. long, cuneately decurrent on the petiole, this less than 1 cm. long; spikes clustered, 1.5–2 cm. long, the 3–4 very slender joints sometimes 8-flowered, the flowers in about 4 series; peduncle 2 mm. long; fruit (immature) 2 mm. thick.—Illustrated, Trelease *pl. 197*.

Amazonas: Chachapoyas, *Mathews*, type.—San Martín: San Roque, 1,400 meters, *Williams 6979*. "Pishcuisman."

Phoradendron obliquum (Presl) Eichl. in Mart. Fl. Bras. 5, pt. 2: 134. 1868; 86. *Viscum obliquum* Presl, Epim. Bot. 225. 1849.

Thick-stemmed, the nearly basal scales sometimes 2 pairs and ordinarily another pair 2–3 cm. higher, tubular; leaves lanceolate, often falcate, very obtuse, 4–8 cm. wide, 10–23 cm. long, basally attenuate to the thick petiole; spikes 5–6 cm. long, the short, swollen joints sometimes 30–40-flowered, the flowers in 4–6 series; peduncle stout, scarcely 5 mm. long, with about 3 pairs of scales; fruit smooth, 3 mm. thick (immature), the sepals closed.—Illustrated, Trelease *pl. 117*.

Huánuco: Huánuco Mountains (*Haenke*, type). Yanano, 1,800 meters, *3811*.—San Martín: San Roque, 1,400 meters, *Williams 7008*. Ecuador.

Phoradendron peruvianum Eichl. in Mart. Fl. Bras. 5, pt. 2: 123. 1868; 131.

Scarcely dichotomous, the internodes ancipitally compressed; scales a single pair, nearly basal, white-margined; leaves broadly lanceolate, sometimes falcate, acute to obtuse, 3–5 cm. wide, 6–12 cm. long, basally acute, the petiole 5–7 mm. long; spikes solitary, finally 4–5 cm. long, the 3–5 stout, oblong joints about 50-flowered, the flowers in 6 series; peduncle stout, 3–4 mm. long; fruit wide, smooth, 4 mm. thick, the sepals closed.—Illustrated, Trelease *pl. 193*.

Without locality, *Ruiz & Pavón*.—Huánuco: Muña, 2,100 meters, *3970*.

Phoradendron piperoides (HBK.) Trelease, Gen. Phorad. 145. 1916. *Loranthus piperoides* HBK. Nov. Gen. & Sp. 3: 443. 1820.

Rather frequently pseudodichotomous or dichotomous; scales 1–5 pairs toward the base of the lowest joint or 10–15 mm. above the base of the other joints, white-margined; leaves lanceolate to round-ovate, mucronately subacute to bluntly acuminate, 2.5–5 cm. wide, 6–10 cm. long; spikes slender, mostly clustered, usually reddish, 3–6 cm. long, with about 6 joints, these 10–15-flowered; peduncle 2–3 cm. long; fruit yellow or orange, warty to smooth, about 4 mm. thick, 5 mm. long, the ascending sepals slightly parted. —Illustrated, Trelease *pl. 217, 222*.

Loreto: Along Río Ucayali, *Tessmann 3345, 3052*. El Recreo, 200 meters, *Williams 3943*. Lower Río Nanay, *Williams 615*. Near mouth of Río Tigre, 115 meters, *Killip & Smith 27523*.—Without locality: *Ruiz & Pavón*.—Huánuco: Río Huallaga Canyon, 1,200 meters, *4246*. Yanano, 1,800 meters, *3720*.—San Martín: Río Mayo, *Williams 6284*. Juan Guerra, 720 meters, *Williams*

6915. San Roque, 1,400 meters, *Williams 6980*. Juanjui, 400 meters, *Klug 3868*. Argentina to Mexico. "Suelda con suelda."

Phoradendron platycaulon Eichl. in Mart. Fl. Bras. 5, pt. 2: 108. *pl. 33*. 1868.

Branches with scales on all the joints, strongly compressed and much dilated, striate, bright green; leaves oblong or linear-oblong, 3–5 cm. long, 3–6 mm. wide, obtuse; spikes clustered, 25 mm. long or less, the joints about 3, 4–6-flowered.—Easily recognized by the rather slender and strongly compressed branches.

Loreto: Caballo-cocha, *Williams 2342*. Amazonian Brazil and French Guiana.

Phoradendron quadrangulare (HBK.) Krug & Urban, Bot. Jahrb. 24: 35. 1898. *Loranthus quadrangularis* HBK. Nov. Gen. & Sp. 3: 444. 1820.

Plants rather slender, the branches conspicuously 4-angulate, only the basal joints with cataphylls; leaves narrowly oblong or elliptic-oblong, conspicuously petiolate, 4–6 cm. long, obtuse, cuneately narrowed at the base; spikes clustered, 3–4 cm. long, the 3–5 slender joints 12–26-flowered; berries white, subglobose, 3 mm. in diameter, the sepals closely inflexed.—Illustrated, Trelease *pl. 154, 155*.

Loreto: Iquitos, 120 meters, *Williams 8026*.—San Martín: Tarapoto, 800 meters, *Williams 5496, 6307*. Ecuador and Colombia. "Pishco isman."

Phoradendron semiteres Trelease, Gen. Phorad. 69. *pl. 85*. 1916.

Somewhat pseudodichotomous; scales a single pair, tubular-bifid, scarious-margined; leaves obliquely or subfalcately lanceolate, obtuse, about 3 cm. wide, 10 cm. long, 5–7-nerved, cuneately decurrent for 10–15 mm.; spikes more or less clustered, to 3 cm. long in fruit, the usually 3 ellipsoid joints 10–23-flowered, the flowers in about 4 series; peduncle 2 mm. long, the scarious-margined scales eciliate; fruit red, nearly smooth, 3 mm. thick, the sepals closed.

Peru: Without locality (*Ruiz & Pavón*). Bolivia.

Phoradendron Urbanianum Ule, Verh. Bot. Ver. Brandenb. 48: 157. 1906; 155.

Very sparingly forked, drying olive; scales a single pair, about 5 mm. above the base of the joint, sharply deltoid, keeled; leaves

elliptic-lanceolate, mucronately acuminate to obtuse, 5–7 cm. wide, 8–13 cm. long, cuneately wing-petioled for about 10 cm.; joints about 4 and 30-flowered, the slightly granular peduncle 3 cm. thick, 4 cm. long.—Illustrated, Trelease *pl. 234*.

Loreto(?): Cerro de Escalera, *Ule 6681* (type).

Phoradendron virgatum Trelease, sp. nov.

Ramis elongatis, internodiis 2–4 cm. longis teretibus; vaginis cataphyllaribus ad basin ramorum, ad internodia caetera nullis; foliis oblongis 2 mm. latis 10 mm. longis obtusis sessilibus, nervis obsoletis; spicis 1–5 ad 3 cm. longis circa 3-articulatis; floribus in articulo 9 vel 11, 4-seriatis; baccis in statu juvenili globosis, sepalis inflexis.—Aequitoriales-Virgatae.

Dark green, glabrous, the long, virgate branches with short (2–4 cm.), terete internodes; cataphylls (not seen) evidently limited to the basal joints; leaves oblong, 2 mm. wide, reflexed, obtuse, sessile, drying concave, coriaceous, not evidently nerved; spikes commonly clustered, about 3 cm. long, with about 3 swollen joints, these 9–11-flowered, the flowers in 4 (2) ranks; peduncle 3 mm. long, the scales blunt, connate; fruit (immature) globose, with inflexed or meeting sepals.

Junín: Carpapata, 2,400 meters (*Killip & Smith 24350;* type in Herb. Field Mus.).—Huánuco: Mito, 2,700 meters, *3343*.

6. ORYCTANTHUS (Griseb.) Eichl.

Reference: Eichler in Mart. Fl. Bras. 5, pt. 2: 87–92. 1868.

Plants parasitic on shrubs and trees, usually with aerial roots and short, axillary racemes of small flowers, the flowers of the Peruvian species perfect.—Closely allied to *Struthanthus*, but the calyx throat barely developed and the bractlets greatly reduced or obsolete. The genus is well illustrated in Pflanzenfam. ed. 2. 16b: 174 (*O. ruficaulis* Eichl.). The species or the forms so recognized are defined very indefinitely, even the presence or absence of the very minute bractlets, often promptly caducous, being of questionable worth as a specific character.

Leaves broad and somewhat clasping.....*O. amplexicaulis.*

Leaves broadly ovate to lanceolate, not clasping.

Spikes pedunculate; leaves often 3 cm. wide or wider.

Spikes mostly in a terminal raceme; bractlets obvious.
O. amazonicus.

Spikes, at least many of them, axillary.

Leaves opposite.....*O. botryostachys.*

Leaves alternate.....*O. ovalifolius.*

Spikes sessile or subsessile, all axillary; leaves 2–2.5 (–3) cm. wide. *O. florulentus.*

Oryctanthus amazonicus Ule, Verh. Bot. Ver. Brandenb. 48: 152. 1907.

Similar to *O. botryostachys* Eichl., but the spikes in the upper leaf axils passing into a terminal raceme 10–25 cm. long, and with tooth-like but caducous bractlets present; branchlets, petioles, and spikes rusty-red-furfuraceous; leaves ovate, 7–10 cm. long, 3–5 cm. broad, nerved and reticulately veined; flowers crowded, yellowish.—Doubtfully distinct. Neg. 11818.

Loreto: Iquitos, *Ule 6252* (type). Pisco, Río Nanay, *Williams 1284.*

Oryctanthus amplexicaulis (HBK.) Eichl. in Mart. Fl. Bras. 5, pt. 2: 88. 1868. *Loranthus amplexifolius* HBK. Nov. Gen. & Sp. 3: 445. 1820.

Nearly glabrous, with subrotund or oval, obsoletely nerved leaves several cm. wide that are subamplexicaul; spikes mostly in a terminal raceme, the peduncles 5–12 mm. long, the spikes little longer.—Well marked by its bluntly rounded, sessile leaves.

Loreto: San Isidro, *Tessmann 4951* (det. Krause). Colombia to the Guianas. "Suelda con suelda."

Oryctanthus botryostachys Eichl. in Mart. Fl. Bras. 5, pt. 2: 89. *pl. 29.* 1868.

Terete branchlets, petioles (2–4 mm. long), and peduncles more or less rusty-furfuraceous, becoming glabrate; leaves broadly ovate or oblong-ovate, rounded at the apex or rather acuminate, 5–8 cm. long, 2.5–5 cm. broad, rounded to the acute juncture with the petiole; nervation obvious but faint; spikes in several leaf axils and in a terminal raceme several cm. to 10 cm. long or longer; peduncles about 1 cm. long, the spikes often twice as long; flowers 2–3 mm. distant; bractlets rudimentary, caducous.—The Weberbauer plant is more than usually reddish and scurfy, and the determination perhaps questionable. The name is sometimes written by recent authors *bothryostachys. O. spicatus* (Jacq.) Eichl. has no (or poorly developed) terminal inflorescence, the flowers 4–5 mm. distant. Neg. 19045.

San Martín: Moyobamba, 1,500 meters, *Weberbauer 4766;* 290 (det. Patschovsky). San Roque, *Williams 7290.*—Junín: Hacienda Schunke, 1,600 meters, *Killip & Smith 24829* (toward *O. florulentus*). Chanchamayo Valley, *Schunke 248.*—Loreto: Iquitos, on *Siparuna, Killip & Smith 27218* (det. Smith). Yurimaguas, *Williams 3819* (form with subsessile spikes). Contamana, 150 meters, on *Anona, Killip & Smith 26875.* Brazil to the Guianas. "Pishcu isman," "suelda con suelda," "pishcumicuna."

Oryctanthus florulentus (Rich.) Urban, Bot. Jahrb. 24: 31. 1897. *Loranthus florulentus* Rich. Act. Soc. Hist. Nat. Paris 107. 1792. *L. ruficaulis* P. & E. Nov. Gen. & Sp. 2: 61. *pl. 185.* 1838. *O. ruficaulis* Eichl. in Mart. Fl. Bras. 5, pt. 2: 90. *pl. 30.* 1868.

Branches more or less compressed-angulate and, with the young leaves, reddish-scurfy, becoming glabrous; petioles 3–5 mm. long; leaves ovate to oblong-elliptic, usually 3–4.5 cm. long, 2–3 cm. broad, most often rounded at each end, or subacute; spikes 1–3 cm. long; flowers red, bracteolate.—*O. spicatus* (Jacq.) Eichl. has been mistaken for this species; it resembles more *O. botryostachys,* which compare. Neg. 21396.

San Martín: Moyobamba, *Weberbauer 4490;* 290 (det. Patschovsky). San Roque, *Williams 7288.*—Huánuco: Monzón, *Weberbauer 3545;* 256 (det. Patschovsky as *O. spicatus;* cf. also *O. botryostachys*). —Loreto: Iquitos, *Williams 3596, 1407.* Pebas, on *Citrus, Williams 1764.* Brazil; Guianas.

Oryctanthus ovalifolius (R. & P.) Macbr. Field Mus. Bot. 11: 17. 1931. *Loranthus ovalifolius* R. & P. Fl. 3: 50. *pl. 177.* 1802. *Struthanthus ovalifolius* G. Don, Gen. Syst. 3: 411. 1834.

Simple-stemmed, glabrous, very fleshy; leaves short-petioled, oval, about 2.5 cm. long; spikes solitary or geminate, 1 cm. long; flowers sessile in the fleshy rachis, crowded; calyx none or minute; fruit oval, purplish.—Referred by Eichler to *O. botryostachys* with a query; perhaps a *Struthanthus.*

Huánuco: Pillao; Chacahuasi (*Ruiz & Pavón*).

7. AETANTHUS (Eichl.) Engler

Nodosely jointed, dichotomously branched plants with heavy leaves and short, axillary racemes of showy flowers.—The group could be retained, as by Eichler, in *Psittacanthus,* but the anthers are very slender and basifixed as in *Loranthus* of the Old World, which it resembles except for the lack of endosperm; see remark at beginning

of family. The nearly related *Psathyranthus amazonicus* Ule, Verh. Bot. Ver. Brandenb. 48: 156. *pl. 2.* 1907, to be expected, has fleshy anthers. The following names represent, probably, in reality only about three variable species.

Anthers cross-celled.

Petioles slender, 1–2.5 cm. long.

Leaves obovate, long-attenuate at the base, 4–8 cm. wide. *A. cauliflorus.*

Leaves elliptic-lanceolate, 4–5 cm. wide..... *A. coriaceus.*

Petioles stout, rarely as long as 12 mm.

Flowers 7.5–10 cm. long; leaves about 6 cm. wide.... *A. nodosus.*

Flowers 5–6 cm. long; leaves to 4.5 cm. wide... *A. subandinus.*

Anthers not cross-celled.

Leaves 3–4.5 cm. wide, obscurely veined..... *A. ornatus.*

Leaves 5–6 cm. wide, obviously veined..... *A. Paxianus.*

Aetanthus cauliflorus Ule, Verh. Bot. Ver. Brandenb. 48: 153. 1907.

Leaves 3–5-verticillate, 12–20 cm. long, long-attenuate to the petiole, this 1.5–2 cm. long, often attenuate also to the obtusish apex; flowers 6–7 cm. long; filaments sharply papillose.—Otherwise apparently very similar to *A. subandinus.* Neg. 3293.

Loreto: Cerro de Escalera, 1,400 meters, *Ule 6908* (type).

Aetanthus coriaceus Patsch. Bot. Jahrb. 45: 437. 1911.

Petioles 1.5–2.5 cm. long; leaves obtuse, 7–8.5 cm. long, the lateral nerves slender; calyculus 5 mm. long; flowers to 8 cm. long, red below, orange above; fruit 2 cm. long, 7 mm. thick.

Cajamarca: Above San Miguel, *Weberbauer 3938* (type); 258.

Aetanthus nodosus (Desr.) Engler, Pflanzenfam. Nachtr. 3, pt. 1: 136. 1897. *Loranthus nodosus* Desr. in Lam. Encycl. 3: 601. 1792. *L. dichotomus* R. & P. Fl. 3: 45. *pl. 274.* 1802. *Psittacanthus dichotomus* Eichl. in Mart. Fl. Bras. 5, pt. 2: 27. 1868.

Branches often ternate; petioles short or 10–12 mm. long; leaves verticillate, 6–10 cm. long, 4–7 cm. wide, lightly nerved, the lateral nerves about 7; peduncles about equaling the petioles, 4–6-flowered; flowers tubular, pendulous, red below, yellow above; fruit greenish yellow, oval, 2 cm. long, 12 mm. thick.—In Herb. Madrid the Ruiz and Pavón specimen is identified by Krause as *Psittacanthus dichotomus!*

Huánuco: Muña, *Ruiz & Pavón;* (*Jussieu*, type). Pampayacu, *Sawada* 34. Tambo de Vaca, 3,900 meters, *4900*. "Mocma," "mucma."

Aetanthus ornatus Krause, Notizbl. Bot. Gart. Berlin 8: 206. 1922.

Petioles 10–13 mm. long; leaves narrowly elliptic or obovate, narrowed at the base, 5–8 cm. long; pedicels 5–8 mm. long; flowers scarlet, with orange limb, the tube 14–18 mm. long, 3 mm. thick at the base to 6 mm. at the apex, the lobes 3.5–4.5 cm. long, 1–1.5 mm. broad; filaments 14–16 mm. long, the anthers 12–15 mm. long.—Nearly *A. Mutisii* (HBK.) Engler, of Ecuador, but the leaves and flowers smaller and the petioles a little longer. Neg. 3295.

Piura: Above Palambla, *Weberbauer 6057* (type).

Aetanthus Paxianus Patsch. Bot. Jahrb. 45: 437. 1911.

Not apparently distinguishable from *A. ornatus* except by the broader, ovate leaves, 8–10 cm. long, the flowers 6–8.5 cm. long, and the filaments 2–2.5 cm. long; fruit ovate, 2 cm. long, 13 mm. thick. Neg. 3296.

Huánuco: Near Monzón, 2,500 meters, *Weberbauer 3390* (type); 255.

Aetanthus subandinus Ule, Verh. Bot. Ver. Brandenb. 48: 154. 1907.

Branches terete, rarely trichotomous; leaves ternate, obovate or broadly oblong, 7–9 cm. long, 3.5–4.5 cm. wide, narrowed to the (3–5 mm. long) petiole, coriaceous, indistinctly nerved; pedicels 2–3 mm. long; calyculus 2–3 mm. long; flowers scarlet; filaments 4 mm. long, epapillose. Neg. 3297.

San Martín: Cerro de Cumbasa, 1,000 meters, *Ule 6318*, type.—Loreto: Mouth of Río Santiago, *Tessmann 4367*. Pumayacu, 600–1,200 meters, *Klug 3164* (det. Standley). Florida, 200 meters, *Klug 2106;* flowers brick-red and yellow. Caballo-cocha, *Williams 2072*. Florida, *Klug 2254*. "Ucuguifise" (Huitoto Indian name).

8. GAIADENDRON G. Don

Typically well marked as indicated in the key; also the original species becomes a tree and subsists then independently. However, two of the Peruvian species are, so far as known, parasitic shrubs, and have been determined in Herb. Madrid by Krause as *Phrygilanthus* sp., following Eichler who, however, reduced the genus *Gaia-*

dendron to *Phrygilanthus*, although Krause himself accepts it; cf. Pflanzenfam. loc. cit. Dr. Charles Baehni has kindly verified my assumption from appearance that these parasitic shrubs must be associated with the original *Gaiadendron*, if the genus is maintained, and the transfer of the species is here made for him, with his permission. G. Don included *Phrygilanthus eugenioides* (HBK.) Eichl. here on the basis of its punctate leaves and sometimes terrestrial habit, but it lacks the persistent bractlets and, presumably, has a 1-celled ovary.

Leaves lanceolate, acuminate; flowers white or yellowish white. *G. Tagua.*

Leaves rounded at the apex or merely acute, often obovate; flowers yellow.

Leaves more or less obovate, rounded or blunt, densely punctate beneath; terrestrial trees.

Bracts not foliaceous.

Flowers about 2 cm. long; ovary 1–1.75 mm. wide. *G. puracense.*

Flowers about 3 cm. long; ovary 2 mm. wide. *G. punctatum.*

Bracts foliaceous. . . . . *G. macranthum.*

Leaves not obovate, acutish, with few or obscure punctations; parasitic shrubs.

Leaves lance-oblong, to 7 cm. long, less than half as broad. *G. lanceolatum.*

Leaves elliptic, mostly 2.5–4 cm. long. . . . . *G. ellipticum.*

Gaiadendron ellipticum (R. & P.) Baehni, comb. nov. *Loranthus ellipticus* R. & P. Fl. 3: 47. *pl. 276.* 1802. *Phrygilanthus ellipticus* Eichl. in Mart. Fl. Bras. 5, pt. 2: 48. 1868.

Apparently too similar to *P. lanceolatus*, but the leaf blades somewhat shorter, the longest about 5 cm. long, on petioles 4–6 mm. long; racemes densely flowered, 3 cm. long.—The leaves of both species are sparsely punctate beneath. Neg. 29469.

Huánuco: Posuso, *Ruiz & Pavón.*—Cuzco: Ollantaitambo, 2,800 meters, *Herrera 683.* Calca, 3,000 meters, *Herrera 2091.* Ollantaitambo, 3,000 meters, *Pennell 13666.* "Matapalo."

Gaiadendron lanceolatum (R. & P.) Baehni, comb. nov. *Loranthus lanceolatus* R. & P. Fl. 3: 47. *pl. 278.* 1802. *L. lancifolius*

Poir. ex R. & S. Syst. 7: 142. 1829. *Phrygilanthus lanceolatus* Eichl. in Mart. Fl. Bras. 5, pt. 2: 48. 1868.

A brown-barked shrub with yellow flowers borne ternately in axillary and terminal racemes 4–7 cm. long; leaves oblong-lanceolate, 2–3 cm. broad, slightly lustrous above, punctate and drying brown beneath, obsoletely veined; petioles 7–10 mm. long; pedicels 2–3 mm. long; bracts ovate, 4 mm. long, reflexed, persistent; flowers about 12 mm. long, the 7–8 divisions nearly filiform; fruit oblong. Neg. 29460.

Huánuco: Pillao, *Ruiz & Pavón* (type).

Gaiadendron macranthum Killip, Journ. Wash. Acad. Sci. 24: 44. 1934.

Leaves obovate, 3.5–5 cm. long, 1.5–2.3 cm. wide; bracts similar to the leaves, 10–25 mm. long, 4–10 mm. wide, persistent; bractlets ovate, 5–7 mm. long, 4–5 mm. wide; flowers in 3's, the lateral short-pediceled; calyx cylindric, 4 mm. long, the margin flaring, entire; petals 7, orange, 3–3.5 cm. long.—Not clearly distinct from *G. punctatum*, but the author separates it on "the large leaf-like bracts, larger bractlets, and longer petals." A shrub about 2 meters high (Weberbauer).

Ayacucho: Putis, Choimacota valley, 3,400 meters, *Weberbauer 7523* (type).

Gaiadendron punctatum (R. & P.) G. Don, Gen. Syst. 3: 432. 1834. *Loranthus punctatus* R. & P. Fl. 3: 47. *pl. 277.* 1802. *Taguaria punctata* Raf. Sylva Tell. 125. 1838. *Phrygilanthus punctatus* Eichl. in Mart. Fl. Bras. 5, pt. 2: 48. 1868.

A tall shrub or small tree with very erect, terete branches; petioles 4–5 mm. long; leaf blades oval or somewhat obovate, acutish at the base, rounded at the blunt apex, to 7 cm. long and 4 cm. wide, slightly lustrous above, dull and densely punctate beneath; flowers in dense, terminal and upper-axillary racemes, these 10 cm. long or longer; peduncles 3–4 mm. long, 2–3-flowered, the elliptic bractlets 7 mm. long; petals 3 cm. long.—Often a tall tree that at flowering time is brilliant because of the myriads of bright yellow flowers, borne so profusely that they seem to clothe all the upper crowded branchlets. Petals 6 in the original specimen, but this scarcely constant. My collection was from a tree more than 20 meters tall.

Cajamarca: Huambos, 2,600 meters (Weberbauer 260).—Huánuco: Pampayacu, *Sawada 59, 40; Kanehira 35.* Playapampa,

2,700 meters, *4894*. Vilcabamba, 1,800 meters, *4971*. Pan de Azúcar, *Sawada 61*. Río Monzón (Weberbauer 255). Tambo de Vaca, *4458*.—Junín: Huasa-huasi, *Ruiz & Pavón*. Above Huacapistana, 3,000 meters, *Killip & Smith 24456;* (Weberbauer 246).—Ayacucho: Carrapa, 1,200 meters, *Killip & Smith 23234, 22296*.—Cuzco: Pillahuata, 2,800 meters, *Pennell 14086* (det. Krause). Urubamba (*Herrera*). Bolivia; Colombia. "Matapalo."

Gaiadendron puracense (HBK.) G. Don, Gen. Syst. 3: 432. 1834. *Loranthus puracensis* HBK. Nov. Gen. & Sp. 3: 437. 1820.

Perhaps only a variety of *G. punctatum*, but slenderer and smaller in all its parts; leaves lance-oblong, slightly obovate, 4–6 cm. long, 2 cm. wide; flowers in terminal, rather long racemes; petals 6–8.—The shorter, slenderer flowers, slender ovary, and smaller bracts are at once apparent in the following Weberbauer material, in contrast to cotype specimens of *G. punctatum*.

Cajamarca: Huambos, 3,000 meters, *Weberbauer 4164* (det. Baehni, ex char.).—Junín: Huacapistana, 2,000 meters, *Weberbauer 2119* (det. Baehni, ex char.). Colombia.

Gaiadendron Tagua (HBK.) G. Don, Gen. Syst. 3: 431. 1834. *Loranthus Tagua* HBK. Nov. Gen. & Sp. 3: 436. 1820.

Leaves oblongish, fleshy-coriaceous, minutely punctate beneath, to nearly 10 cm. long, 3–4 cm. wide; racemes 2–3 cm. long, axillary, solitary; bractlets about as long as the calyx; petals 7, 2 cm. long; flowers yellowish white, fragrant.—Peru to Costa Rica, British Guiana, and Venezuela, according to Krause.

Peru: Apparently. Colombia.

9. PHRYGILANTHUS Eichl.

Half parasitic shrubs or rarely terrestrial trees, with mostly opposite leaves and conspicuous, red, yellow, or white flowers. Calyx rim obvious. Filaments definitely narrowed beneath the versatile anthers in contrast to those of *Aetanthus*.—Besides the following, *P. heterophyllus* (R. & P.) Eichl., *P. tetrandrus* (R. & P.) Eichl., and *P. aphyllus* (Miers) Eichl. have been reported in Peru in literature as recently as in the new edition of the *Pflanzenfamilien* but I have seen no specimens or definite citations that are not highly questionable, as for example Dombey material given as Peruvian. A "*P. Lehmanianus*" mentioned by Weberbauer, 162, "toward Ocros," Cajamarca, seems to be an unpublished name for a specimen probably referred to one of the following.

Flowers 6–8-parted; inflorescences mostly axillary.
Pedicels of the flowers subequal.
Leaves about 3 cm. long or shorter.....*P. ligustrinus.*
Leaves 5–10 cm. long.
Parasitic shrubs; bracts promptly deciduous.
Leaves 5–7 cm. long; pedicels 1–3-flowered.*P. acutifolius.*
Leaves 8–10 cm. long; pedicels 3-flowered.....*P. repens.*
Trees; bracts rather tardily deciduous.....*P. eugenioides.*
Pedicels unequal, the middle much shorter, or the flowers sessile.
P. suaveolens.
Flowers 5-parted; inflorescences mostly terminal.
Flowers about 10 cm. long or longer.
Bracts conspicuously exceeding the calyculus.
Leaves attenuate at the base, narrowly lanceolate.
P. monzoniensis.
Leaves rounded at the base, broadly ovate or elliptic.
P. grandiflorus.
Bracts small, little if at all longer than the calyculus.
Leaves short-petioled.....*P. Chodatianus.*
Leaves sessile.....*P. peruvianus.*
Flowers 2–5 cm. long.
Leaves opposite; bracts conspicuous.....*P. longebracteatus.*
Leaves often ternate; bracts small.....*P. verticillatus.*

Phrygilanthus acutifolius (R. & P.) Eichl. in Mart. Fl. Bras. 5, pt. 2: 49. 1868. *Loranthus acutifolius* R. & P. Fl. 3: 48. *pl. 274.* 1802. *Psittacanthus acutifolius* G. Don, Gen. Syst. 3: 417. 1834.

Very similar to *P. eugenioides,* but perhaps always parasitic; leaves lanceolate, acutely long-acuminate, obscurely veined, dull on both sides, 5–10 cm. long, about 2 (–2.5) cm. broad; racemes 3 cm. long; ternations and flowers pedicellate, the pedicels of each about 3 mm. long; bracts promptly deciduous; flowers white, 12 mm. long; fruit oval, black, the size of a pea.—The bracts are not "tardily deciduous" on the type specimen. *Loranthus albiflorus* Hook. Icon. *pl. 683* is the same, according to Eichler. Neg. 29457.

Huánuco: *Ruiz & Pavón.*—Ayacucho: Rocky cliffs, *Weberbauer 5518.* Ecuador.

Phrygilanthus Chodatianus Patsch. Bot. Jahrb. 45: 435. 1911.

Internodes 1–2 cm. long; leaves obovate, strongly cuneate to the base, 3–4.5 cm. long, about 0.7 cm. broad; racemes secund, 4.5 cm. long; bracts 4–5 mm. long; calyx 2–3 mm. long; flowers 4 cm. long, scarlet; fruit 1 cm. long, scarlet.—On *Polylepis*. Negs. 3286, 27827.

Ancash: Pichiu, 4,000–4,100 meters, *Weberbauer 2934* (type); 217, 225.—Ica: Above Pisco, *Weberbauer 5434* (det. Krause).

Phrygilanthus eugenioides (HBK.) Eichl. in Mart. Fl. Bras. 5, pt. 2: 50. 1868. *Loranthus eugenioides* HBK. Nov. Gen. & Sp. 3: 435. 1820. *Gaiadendron eugenioides* G. Don, Gen. Syst. 3: 431. 1834.

Branches rugose; leaves ovate-lanceolate, sometimes narrowly so, basally attenuate to the slender petiole, long-acuminate, usually about 10 cm. long, lustrous above, more or less obviously veiny and punctate beneath; racemes axillary and terminal, often several cm. long; bracts promptly caducous; flowers pedicellate, 12–16 mm. long, greenish white; calyx scarcely 1 mm. high; fruit black, 8 mm. long.—Variable in shape and size of leaves; very doubtfully distinct from *P. acutifolius*. Half parasitic on trees or growing independently. Illustrated, Mart. Fl. Bras. 5, pt. 2: *pl. 12*.

Huánuco: Huariaca, 2,850 meters, *2402*. San Rafael, *Sawada 115*. Ambo, 2,100 meters, *3198*.—Amazonas: Chachapoyas, *Weberbauer 4386;* 263 (det. Patschovsky).—Piura: Huancabamba (*Humboldt*, type). Negritos, *Haught*. Argentina to Brazil.

Phrygilanthus grandiflorus (R. & P.) Eichl. in Mart. Fl. Bras. 5, pt. 2: 46. 1868. *Loranthus grandiflorus* R. & P. Fl. 3: 45. *pl. 273*. 1802.

Branches more or less pendent, bearing terminally several scarlet flowers 10–15 cm. long; leaves usually opposite, oval or elliptic, blunt, slightly lustrous above, somewhat veiny; bracts persistent, foliaceous, well exceeding the calyx; fruit oval, bluish, the size of an olive.

Huánuco: Posuso, Muña, Pillao (*Ruiz & Pavón*). Monzón, *Weberbauer 3366* (det. Patschovsky).—Cajamarca: Nanchó, *Raimondi*. "Hatun-mocma," "hatun-mucma," "moma."

Phrygilanthus ligustrinus (Willd.) Eichl. in Mart. Fl. Bras. 5, pt. 2: 48. 1868. *Loranthus ligustrinus* Willd. ex R. & S. Syst. 7: 136. 1829. *L. ligustrifolius* Willd. op. cit. 135.

Similar in general to *P. acutifolius*, but the leaves only about half as large and the flowers corymbose or racemosely congested.—In Peru according to Engler & Krause, Pflanzenfam. Neg. 11820.

Peru(?): (*Haenke*, type of *L. ligustrifolius*). "Middle America" (*Humboldt*).

Phrygilanthus longebracteatus (Desr.) Macbr. Field Mus. Bot. 11: 17. 1931. *Loranthus longebracteatus* Desr. in Lam. Encycl. 3: 599. 1792. *L. glaucus* R. & P. Fl. 3: 45. *pl. 275*. 1802. *L. corymbosus* Dietr. Gaert. Lex. Nachtr. 4: 468. 1815–21. *P. corymbosus* Eichl. in Mart. Fl. Bras. 5, pt. 2: 46. 1868.

Allied to *P. verticillatus*, but with showy, reddish flowers, medially yellow, 3.5–5 cm. long, and conspicuous bracts 1 cm. long; leaves glaucous, opposite, ovate-lanceolate, obtusely subacuminate; inflorescences terminal, few-flowered; fruit deep purple, ovate-oval.—Flowers scarlet, according to Weberbauer. Neg. 29458 (*P. glaucus*).

Huánuco: Yanano, 1,800 meters, *3737*. Mito, 2,700 meters, *3344*. Huasa-huasi, Pillao, Muña, Chinchao, *Ruiz & Pavón*.—Cajamarca: Cutervo, *Raimondi* (det. Krause).—Ancash: Chiquián, *Weberbauer 2849* (det. Krause).—Junín: Huancayo, *Raimondi*. Chile to Colombia. "Pupa."

Phrygilanthus monzoniensis Patsch. Bot. Jahrb. 45: 436. 1911.

Branches papillose-verrucose, the internodes 2 cm. long; leaves lanceolate, acuminate, about 4 cm. long, 4–8 mm. broad, the narrowed petiolar base 3–5 mm. long; flowers 8 cm. long, the foliaceous bracts 2 cm. long; calyx dentate, 6 mm. long; fruit ellipsoid, 12 mm. long, black.—Flowers bright red, orange-zoned. Negs. 3288, 27828.

Huánuco: Near Monzón, 3,400 meters, *Weberbauer 3342* (type).

Phrygilanthus peruvianus Patsch. Bot. Jahrb. 45: 435. 1911.

A shrub of 2 meters, the internodes 6–9 cm. long; leaves ovate-lanceolate, acute, 4–5.5 cm. long, 3–4 cm. broad; flowers to 9 cm. long, red, in terminal, secund racemes; bracts acute, 4–5 mm. long, 2 mm. broad; calyx twice as long; fruit red, 1 cm. long. Neg. 3287.

Ancash: Ocros, 2,400–3,500 meters, *Weberbauer 2117, 3147*.—Lima: San Buenaventura, 2,800 meters, *Pennell 14545;* flowers scarlet-red.

Phrygilanthus repens Patsch. Bot. Jahrb. 45: 436. 1911.

A parasitic shrub with long adventitious roots; internodes 3–4 cm. long; leaves lanceolate, 1–1.5 cm. broad, acutely acuminate,

narrowed into a petiole 2 cm. long; racemes about 8 cm. long, the pedicels 3-flowered; petals 6, white; calyx 3 mm. long, dentate; fruit 7 mm. long.—Perhaps not a *Phrygilanthus;* parasitic on *Schinus Molle,* the white flowers very fragrant. Neg. 3289.

Ancash: Valley of the Puccha, *Weberbauer 3733* (type).

Phrygilanthus suaveolens (HBK.) Eichl. in Mart. Fl. Bras. 5, pt. 2: 49. 1868. *Loranthus suaveolens* HBK. Nov. Gen. & Sp. 3: 435. 1820.

Branches terete, smooth; leaves ovate-oblong, rounded at the base, acuminate, lustrous above, about 5 cm. long, half as wide; petioles 4–5 mm. long; racemes 2–4 in the axils; flowers white, short-pediceled, the middle subsessile, 6–8 mm. long, ebracteate; calyx obsoletely dentate. Neg. 3290.

Cajamarca(?): Gonzanama (*Humboldt*).

Phrygilanthus verticillatus (R. & P.) Eichl. in Mart. Fl. Bras. 5, pt. 2: 47. 1868. *Loranthus verticillatus* R. & P. Fl. 3: 47. 1802. *L. Poeppigii* DC. Prodr. 4: 308. 1830; P. & E. Nov. Gen. & Sp. 2: 61. *pl. 184.* 1838.

A half parasitic shrub with verticillate, erect branchlets and subverticillate, lanceolate, enervose leaves; flowers crowded, grenadine red, mostly borne ternately, 3–5 cm. long; bracts shorter than the calyx; fruit oval, purplish black.

Cuzco: Urubamba (*Weberbauer 4901*); (*Herrera 2271;* det. Krause). Chile; Bolivia. "Ictriho," "itiu," "ictrigo," "bela-bela."

10. PSITTACANTHUS Mart.

Reference: Eichler in Mart. Fl. Bras. 5, pt. 2: 23–45. 1868.

Except for the negative character, "endosperm lacking," the genus can not be distinguished, all species considered, from *Phrygilanthus.* The majority of species, however, may be recognized by the presence of a cup-like bracteal development in which the ovary is partly concealed and which may represent the complete union of the bractlets; it is hereafter referred to as a "cup."

Flowers solitary or few, axillary or nodose; nodes not or little enlarged.

Leaves about 1 cm. long..... *P. cuneifolius.*

Leaves about 10 cm. long or longer.

Petioles often 1 cm. long; leaves cuneate or acute at the base; flowers red.

Pedicels verruculose; flowers acute.....*P. crassifolius.*

Pedicels smooth; flowers truncate.....*P. peculiaris.*

Petioles to 7 mm. long; leaves not at all acute at the base; flowers red or yellow.....*P. Krausei.*

Flowers racemose, the racemes often short, or in branched inflorescences, the nodes enlarged in many cases.

Leaves opposite or ternate (see also *P. calcaratus*).

Leaves cordate-amplexicaul.

Leaves auricled at the base.....*P. amplexifolius.*

Leaves merely slightly clasping the stems.....*P. cardiphyllus.*

Leaves little if at all cordate.

Leaves narrowly oblong or, if ovate, round-obtuse at the apex.

Cup cyathiform; leaves 3–6 cm. wide.....*P. Cordiae.*

Cup patelliform; leaves rarely as wide as 3 cm.

Leaves subsessile; peduncles 6–8 mm. long...*P. obovatus.*

Leaves sessile; peduncles 15 mm. long.....*P. tumbecensis.*

Leaves ovate-lanceolate, acuminate or at least narrowed to the apex.

Calyx much exceeded by a foliaceous bract....*P. cucullaris.*

Calyx not so subtended.

Leaves 10 cm. long or much longer.

Flowers pedicellate.....*P. subalatus.*

Flowers sessile.....*P. cupulifer.*

Leaves 3 cm. long or shorter.....*P. coccineus.*

Leaves alternate or not strictly opposite.

Flowers usually 8–10 cm. long.....*P. calcaratus.*

Flowers 1–4 cm. long.

Leaves roundish, not at all narrowed at the base.
P. Weberbaueri.

Leaves cuneate at the base, narrow.

Leaves petioled; calyx twice longer than the cup.
P. divaricatus.

Leaves sessile; calyx slightly longer than the cup.
P. linearis.

Psittacanthus amplexifolius (van Tiegh.) Engler, Pflanzenfam. Nachtr. 1: 136. 1897. *Arthraxon amplexifolius* van Tiegh. Bull. Soc. Bot. France 42: 353. 1895.

Allied to *P. cardiphyllus*, but the leaves auricled at the pronouncedly amplexicaul base, as in *P. cordatus*, but rounded at the apex; perianth in bud not enlarged apically.

Cajamarca: Jaén (*Vidal Senège*).

Psittacanthus calcaratus A. C. Smith, Bull. Torrey Club 58: 89. 1931.

Branches stout, subquadrate; leaves veiny, rather thin, blunt or rounded at the apex, cuneate to the base, subelliptic, mostly 11–12 cm. long, 5 cm. broad; petioles 1–1.5 cm. long; inflorescence terminal, crowded; peduncles to 4 cm. long, the stout pedicels about half as long; cup 2 mm. long, 4–5 mm. wide at the rim, subpatelliform; calyx 4 mm. long, truncate, minutely denticulate or entire; perianth blunt, 7–9.5 cm. long, each interior margin of the 6 linear lobes triangularly spurred near the tip; filaments attached 11 mm. below the tip of the perianth, 5–6 mm. long, equaling the pubescent anthers.—Flowers red and yellow. The related *P. clusiifolius* (Willd.) Eichl., with leathery leaves and stamens attached near the tip of the perianth segments, may occur.

Loreto: Mishuyacu, 100 meters, *Klug 694* (type).

Psittacanthus cardiphyllus (Willd.) Eichl. in Mart. Fl. Bras. 5, pt. 2: 27. 1868. *Loranthus cardiphyllus* Willd. ex R. & S. Syst. 7, pt. 1: 162. 1829.

Like *P. Cordiae*, but the leaves distinctly cordate at the base; terminal racemes many-flowered, with about 10 nodes, the pedicels 3–4 mm. long.—Of this affinity are *P. bicalyculatus* (Mart.) G. Don and *L. cordatus* (Hoffm.) G. Don, the former with longer pedicels, 2–4 inflorescence nodes, and oblongish leaves, the latter with lanceolate, acuminate leaves, hastately cordate at the base.

Peru(?): Probably. Brazil.

Psittacanthus coccineus Patsch. Bot. Jahrb. 45: 436. 1911.

Glabrous; leaves opposite, sessile, lanceolate, 3 cm. long, 4–8 mm. broad, subcoriaceous, the nervation evident; flowers in terminal racemes, on pedicels 4 mm. long; cup 2 mm. long, the usually dentate calyx 3 mm. long; perianth segments free, red, nearly 3 cm. long, the filiform filaments attached below the middle; fruit elliptic-oblong, black, 4 mm. long, 2 mm. thick.—On *Salix* and *Schinus Molle*. Neg. 3299.

Ancash: Near Ocros, *Weberbauer 2643* (type).

Psittacanthus Cordiae Krause, Notizbl. Bot. Gart. Berlin 8: 206. 1922.

Branchlets terete; leaves sessile or nearly so, rigid-coriaceous, ovate or roundish, rarely slightly emarginate at the base, 5–8 cm. long, 3–6 cm. wide; nerves many, obvious; flowers short-pediceled, in terminal racemes; bracts broadly ovate, 2–2.5 mm. long, about as long as the cyathiform cup, this scarcely equaling the ovary; perianth scarlet, the linear-lanceolate lobes usually free to the base, 3–3.4 cm. long, sparsely and very shortly pilose without; filaments about medially inserted; anthers 2–2.5 mm. long.—*P. chanduyensis* Eichl. and *P. obovatus* Benth., both Ecuadorian, may be expected; the former has smaller leaves, rarely 3.5 cm. long, and very short racemes; the latter obovate leaves, more or less attenuate basally, distinctly nervose, 2.5–5 cm. long. Neg. 3298. *P. cinctus* (Mart.) G. Don with scurfy inflorescence and orange-tomentose flowers would also be sought here.

Piura: On *Cordia rotundifolia*, near Serrán, 200–300 meters, *Weberbauer 5996* (type). La Brea, 150 meters, *Weberbauer 7766*.—Without locality, *Raimondi*. "Piña."

Psittacanthus crassifolius (Mart.) G. Don, Gen. Syst. 3: 417. 1834. *Loranthus crassifolius* Mart. ex R. & S. Syst. 7, pt. 1: 123. 1829.

Young parts obsoletely reddish-scurfy; branches terete; leaves broadly ovate or elliptic, fleshy-coriaceous, opaque, 8–12 cm. long, 5–7 cm. broad or exceptionally half again as large; flowers mostly ternately arranged in the axils, the common peduncle 4–6 mm. long; perianth to 9 cm. long, the filaments attached to about 1 cm. below the apex, the anthers 5–6 mm. long.—A. C. Smith, from whom this description, in part, is drawn, observed 1 or 2 spurs on each perianth lobe. Neg. 19056.

Loreto: Mishuyacu, 100 meters, *Klug 119* (det. Smith). Brazil.

Psittacanthus cucullaris (Lam.) G. Don, Gen. Syst. 3:416. 1834. *Loranthus cucullaris* Lam. Journ. Hist. Nat. Paris 1: 444. *pl. 23*. 1793.

Completely glabrous, drying black; petioles 2–6 mm. long; leaves elliptic-oblong or linear-lanceolate, acute, to 10 cm. long, 1.5–4 cm. broad, subcoriaceous, with 5–7 nerves; flowers terminally paniculate, the peduncle of the ternations to 12 mm. long; bracts cucullate-concave, foliaceous, 12–20 mm. long; perianth segments yellow, orange, or reddish, the filaments medially inserted; fruit ellipsoid.—Illustrated, Mart. Fl. Bras. 5, pt. 2: *pl. 7*.

Loreto: Mishuyacu, *Klug 1317* (det. Smith). Brazil to the Guianas.

Psittacanthus cupulifer (HBK.) G. Don, Gen. Syst. 3: 417. 1834. *Loranthus cupulifer* HBK. Nov. Gen. & Sp. 3: 438. 1820.

Allied to *P. cucullaris;* branches terete; leaves subsessile, obliquely ovate-oblong, narrowed to the obtuse apex, reticulate, 2.5–5 cm. broad; inflorescences densely flowered, 3–6 cm. long, the flowers sessile or subsessile, 4 cm. long, subtended by a concave bract 5 mm. long; calyx 6–8 mm. long; filaments medially adnate; fruit ellipsoid. —Weberbauer noted the flowers as scarlet below, golden yellow medially, orange toward the tips; Klug as yellowish green and red, yellow and red, and yellow. Here as elsewhere G. Don has been accepted as second authority for the name instead of Blume, who in R. & S. Syst. 7, pt. 2: 1730. 1830, indicated the transfer without actually making it.

San Martín: Moyobamba, *Weberbauer 4718* (det. Patschovsky). —Loreto: Maucallacta, 200 meters, *Klug 3955.* Pebas, *Williams 1871.* Florida, 180 meters, *Klug 2189, 2325.* Fortaleza, 140 meters, *Williams 4315; Klug 2804.* Lower Río Nanay, *Williams 614, 531.* Yurimaguas, 180 meters, *Williams 7875, 7874.* Caballo-cocha, *Williams 2442.* Río Nanay, *Raimondi.* Middle Río Apaga, *Tessmann 3838* (det. Krause). Lower Río Blanco, *Tessmann 3076* (det. Krause). Ecuador to Bolivia. "Pishcu-isman," "jucu-gui-o" (Huitoto name), "suelda con suelda."

Psittacanthus cuneifolius (R. & P.) G. Don, Gen. Syst. 3: 416. 1834. *Loranthus cuneifolius* R. & P. Fl. 3: 46. *pl. 276.* 1802. *Phrygilanthus cuneifolius* Eichl. in Mart. Fl. Bras. 5, pt. 2: 49. 1868.

Densely branched, the slender branches spreading; leaves oblong-cuneate or narrowly obovate, subsessile, 1.5–2 cm. long, about 5 mm. broad, apically rounded, mucronate, faintly 3-nerved; flowers solitary or 3–5 in axillary fascicles or racemes scarcely 1 cm. long, the pedicels 5–7 mm. long; cup 2.5 mm. deep, the teeth marked, the calyx nearly twice as long; flowers about 3 cm. long, yellowish red; petals coalescent; filaments filiform, subulate; fruit 8–10 mm. long. —Subsp. *peruanus* Engler is apparently the typical, i.e. the Peruvian, form. A shrub of 5 meters on Rhamnaceae (Killip & Smith). The fruits are used for the making of bird lime, which boys smear on the branches of trees to catch small birds, particularly the "chchainas" (*jilgueros*); the gum is employed also as a plaster for fractures, etc. (Herrera). Neg. 29462.

Huánuco: Cheuchín, *Ruiz & Pavón*. Chulki, *Sawada 57*. Mito, 2,700 meters, *1781*. Huánuco, 2,100 meters, *2046*.—Junín: Between Viques and Ingahuasi, 3,150 meters, *Killip & Smith 22173*.—Cuzco: Capana, Prov. Paucartambo (*Herrera 635*). Parcocella, 3,600 meters, *Herrera 1144*.—Arequipa: Yura, 2,700 meters, *Weberbauer 1415*. Above Pampa Redonda, *Weberbauer 5767*.—Ayacucho: Ayacucho, 3,100 meters, *Weberbauer 5530*. Chile to Brazil. "Pupa," "liga," "suelda con suelda."

Psittacanthus divaricatus (HBK.) G. Don, Gen. Syst. 3: 417. 1834. *Loranthus divaricatus* HBK. Nov. Gen. & Sp. 3: 433. 1820.

Branches spreading; leaves subsessile, elliptic-oblong, rounded at the apex, coriaceous, 2–3 cm. long, 10–18 mm. wide; peduncles 3-flowered, paniculately disposed; flowers 2.5 cm. long or longer, on pedicels to 4 mm. long; calyx obsoletely dentate.—The original locality is given as perhaps the Río Orinoco, but the species is accredited in literature to Chile.

Cajamarca: Nanchó, *Raimondi*. Brazil(?); Chile(?).

Psittacanthus Krausei Macbr. Candollea 5: 349. 1934.

Branches terete, markedly nodose; petioles 6–7 mm. long; leaves ovate, attenuately and acutely acuminate, to 10.5 cm. long, about 3.5 cm. broad; flowers 2–3 in corymbs and umbels, the common peduncle 12–15 mm. long; pedicels glabrous, 10–12 mm. long; flowers lustrous, 6–6.5 cm. long; anthers 3 mm. long, with a mucro 2 mm. long.—*P. peronopetalus* Eichl., with larger leaves, puberulent inflorescence, shorter pedicels, and short-mucronulate anthers, may be expected. *P. biternatus* (Hoffm.) G. Don, similar, has elliptic leaves rounded at both ends.

Loreto: Mishuyacu, 100 meters, *Klug 1323* (type).

Psittacanthus linearis (Killip) Macbr., comb. nov. *Phrygilanthus linearis* Killip, Journ. Wash. Acad. Sci. 24: 45. 1934.

Glabrous, with terete branches and linear, obtuse leaves, slightly narrowed at the base, sometimes subopposite, 2–3.5 cm. long, 1.5–5 mm. wide, obscurely 1-nerved; inflorescence compactly subcorymbose, the spreading pedicels of the ternately arranged flowers 3–5 mm. long; bractlets triangular-ovate, 2–3 mm. long; cup 2–2.5 mm. deep, denticulate, slightly exceeded by the subentire calyx; petals 6, bright red or scarlet, 2–2.5 cm. long; filaments about 2 cm. long, thus attached toward the base.—This plant, from description, must be a *Psittacanthus*, apparently similar to *P. coccineus*.

According to Haught, it is slender, semi-trailing, almost always on "algarroba," the branches 2 meters long or longer, flowering all the year and broken off with long poles by goat herders for their animals that seem to prefer this to any other plant. On *Acacia* and *Prosopis limensis*.

Piura: Prov. Paita (*Haught 9*, type). Negritos, *Haught F21*. La Brea, *Weberbauer 7765*. Prov. Paita (*Townsend 823?;* "but leaves to 6 cm. long, 15 mm. wide"). "Piña."

Psittacanthus obovatus Benth. ex Eichl. in Mart. Fl. Bras. 5, pt. 2: 27. 1868. *Loranthus obovatus* Benth. Bot. Voy. Sulph. 103. 1844.

Slightly scabrous; branches dichotomous or verticillate; leaves subsessile, obovate, obtuse, rounded or cuneate at the base, faintly reticulate-veiny, 2.5–5 cm. long, 12–25 mm. wide; racemes with 5–6 short nodes; peduncles 6–8 mm. long, finely puberulent; flowers in 3's, the pedicels 4–6 mm. long; cup a little shorter than the calyx; petals 6, 3.5–4 cm. long.—Allied by Eichler with *P. chanduyensis* Eichl. with sessile, not at all obovate leaves.

Piura: Negritos, *Haught F22*. Ecuador. "Piña."

Psittacanthus peculiaris A. C. Smith, Bull. Torrey Club 58: 90. 1931.

Leaves ovate-lanceolate, falcate to broadly ovate, cuneate at the base, narrowly acuminate or sometimes only acute, 4–8 cm. wide, mostly 10–12 cm. long; petioles about 1 cm. long; flowers red, usually 2 or 3, the common peduncle and pedicels 2–3 mm. long; cup subpatelliform, 0.8 mm. long, 2 mm. wide at the rim; corolla finally to 5 cm. long, very slender toward the base, the throat narrowed, the linear lobes each partly obscured by a fleshy, oblong, horizontal spur nearly 2 mm. long; filaments scarcely 1 mm. long.

Loreto: Mishuyacu, 100 meters, *Killip & Smith 29967* (type); *Klug 118, 1206*. Peña Blanca, Río Itaya, 110 meters, *Killip & Smith 29653*. Leticia, *Williams 3147*. Lower Río Nanay, *Williams 593, 646*.

Psittacanthus subalatus Krause, Notizbl. Bot. Gart. Berlin 8: 207. 1922.

Branchlets stout, 4-angled and wing-margined; petioles 1–3 mm. long; leaves coriaceous, rarely cordate-emarginate at the base, mostly subfalcate, to 20 cm. long, 4–9 cm. wide; lateral nerves distinct on both sides; flowers pedicellate; bracts broadly ovate, con-

cave, 2–3 mm. long, the subpatelliform cup 2–3 mm. long, the calyx 2 cm. long; ovary 5–6 mm. long; perianth lobes roseate, free to the base; filaments medially attached, 3–4 cm. long; style 7–8.5 cm. long.—Differs from *P. cupulifer* (HBK.) Eichl. in its larger and broader leaves and much smaller cup. *P. falcifrons* (Mart.) G. Don, with golden yellow flowers and oblong-lanceolate leaves 1–4 cm. wide, may be expected. Neg. 3300.

Piura: Above Palambla, 1,400 meters, *Weberbauer 6030* (type).

Psittacanthus tumbecensis (Killip) Macbr., comb. nov. *Phrygilanthus tumbecensis* Killip, Journ. Wash. Acad. Sci. 24: 45. 1936.

Leaves narrowly oblong, subfalcate, 5–10 cm. long, 1.5–3 cm. wide, obtuse, narrowed at the base, with many obscure nerves; inflorescence loosely corymbose; bractlets 2–3 mm. long; cup 2–2.5 mm. long, 4–5 mm. wide, the calyx slightly longer; petals 6, 3–4 cm. long, "fiery red with yellow point."—Apparently allied to *P. obovatus*.

Túmbez: Mountains east of Hacienda Chicama, 500–700 meters, *Weberbauer 7668*, type.

Psittacanthus Weberbaueri Patsch. Bot. Jahrb. 45: 437. 1911.

Glabrous, erect; leaves sessile, oblong-ovate, obtuse or rounded at the apex, 3–3.5 cm. long, 2–2.5 cm. broad, the lateral nerves reticulate; flowers in terminal racemes on pedicels 3–4 mm. long; cup cucullate, the calyx 3 mm. long; perianth 2.3–3.5 cm. long; filaments filiform, medially attached; fruit oblong, 5 mm. long, 3 mm. thick. Neg. 3301.

Cajamarca: Llallan, 600–700 meters, *Weberbauer 3796* (type).

11. PERISTETHIUM van Tiegh.

Reference: van Tiegh. Bull. Soc. Bot. France 42: 175. 1895.

A segregate of *Phrygilanthus*, but as well marked as any genus by virtue of its small flowers crowded in axillary inflorescences and basally subtended by white bracts that on falling leave a little collar, to which peculiarity the generic name refers.—No Peruvian specimen appears to exist, but the plant is included here because *definitely* stated to occur in Peru by all authorities!

Peristethium leptostachyum (HBK.) van Tiegh. loc. cit. *Loranthus leptostachyus* HBK. Nov. Gen. & Sp. 3: 440. 1820.

Petioles 10–12 mm. long; leaf blades ovate-elliptic, acuminate, net-veined, about 10 cm. long and half as wide; axillary spikes 2–several, much shorter than the leaves; flowers scarcely 4 mm. long.

Peru: (Occurrence doubtful). Colombia.

12. STRUTHANTHUS Mart.

Phthirusa Mart. Flora 13, pt. 1: 110. 1830.

Reference: Eichler in Mart. Fl. Bras. 5, pt. 2: 52–87. 1868.

Erect or not infrequently scandent shrubs, often developing adventitious roots. Flowers tiny, in simple or branched, axillary or terminal spikes, racemes, or panicles, or rarely solitary or subsolitary, usually dioecious or perfect. Stamens often unequal, the filaments of the longer then sometimes scalloped at each side, apparently by pressure of the anthers of the shorter ones. Filaments in varying degree thin and slender, short and thick, or even lacking, even in staminate flowers.—Except in treating *Loranthus* L. sensu lat., this group must be maintained as distinct. Even though its character of small flowers is intangible, this is obviously a natural genus or, in the former case, subgenus. Here, as elsewhere in the family, G. Don is given as second authority in place of Blume in R. & S. Syst. 7, pt. 2: 1731. 1830, where the combinations are only indicated. Rubber has been produced commercially from two of the species found in Peru, *S. aduncus* and *S. pyrifolius*, the fruits having yielded as high as 7 per cent rubber on an average. The practicability of cultivation is highly questionable (Krause), so that no economic significance can be envisaged, the exploitation of wild plants for this purpose surely being very limited.

Plants glabrous; filaments (except in 2 species) slender.

Leaves 5–7.5 cm. wide, at least most of them, or the filaments thick, often scalloped.

Filaments thin, straight; leaves all or most of them wider than 5 cm.

Verticels bracteolate, pedicellate, more or less paniculate. *S. retroflexus.*

Verticels spicate, ebracteolate or the bractlets promptly caducous ..... *S. polystachyus.*

Filaments thick, often laterally scalloped; leaves mostly 4–5 cm. wide.

All the flowers panicled; anthers acuminate .... *S. aduncus.*

All or nearly all the flowers spicate or racemose; anthers mucronate.....*S. Eichleri.*

Leaves regularly narrower, rarely if ever some of them about 5 cm. wide.

Verticels ebracteolate or the bractlets very promptly caducous, free; leaves little longer than broad.

Racemes several cm. long.....*S. orbicularis.*

Racemes less than 1 cm. long.....*S. lucarquensis.*

Verticels bracteolate, the bractlets more or less united; leaves usually distinctly longer than broad.

Flower clusters all in corymbs or pseudocymes, the inflorescence rarely longer than 2 cm., usually shorter.

Leaves obovate-suborbicular.....*S. retusus.*

Leaves oblong-lanceolate.....*S. dichotrianthus.*

Flower clusters in spikes or racemes often longer than 2 cm., the terminal inflorescence rarely paniculate.

Flower clusters borne in spikes (typically).

Spikes 2–5 cm. long; flowers to about 6 mm. long; leaves nearly nerveless.....*S. concinnus.*

Spikes 1 cm. long; flowers to 3 mm. long; leaves nerved. *S. tenuis.*

Flower clusters pedicellate, that is, racemose (cf. *S. tenuis*).

Leaves fleshy, veinless.....*S. acuminatus.*

Leaves thin, veiny on both sides.....*S. sarmentosus.*

Plants more or less reddish-furfuraceous; filaments thick.

Inflorescence branchlet not conspicuously compressed; fruit reflexed.....*S. pyrifolius.*

Inflorescence branchlet strikingly compressed; fruit spreading. *S. platycladus.*

Struthanthus acuminatus (R. & P.) Blume ex R. & S. Syst. 7, pt. 2: 1731. 1830. *Loranthus acuminatus* R. & P. Fl. 3: 49. 1802.

Slender, with long, virgate, slightly angled branches, the narrowly ovate-lanceolate, long-acuminate leaves remote; petioles 3–5 mm. long; leaf blades 6–7 cm. long, 1.5–2.5 cm. broad, rounded or scarcely acute at the base, dull; racemes solitary, about 4 cm. long, the slender rachis sharply quadrate; ternation pedicels 2 mm. long, the flowers sessile; bracteoles tardily caducous, nearly free, subequal, shorter than the calyx; flowers pale yellowish, 4 mm. long, the

medially attached filaments very short; fruit oval.—In aspect similar to some forms of *S. thyrsiflorus* (C. & S.) Blume (*S. syringifolius* Mart.), with short-acuminate and somewhat veiny leaves and one bractlet longer than the other. Neg. 29464.

Huánuco: Pillao, Chinchao, Panao, *Ruiz & Pavón.*

Struthanthus aduncus (Meyer) G. Don, Gen. Syst. 3: 414. 1834. *Loranthus aduncus* Meyer, Prim. Fl. Esseq. 149. 1818. *L. paniculatus* HBK. Nov. Gen. & Sp. 3: 442. 1820. *L. conduplicatus* HBK. op. cit. 441. *L. Theobromae* Willd. ex R. & S. Syst. 7: 132. 1829. *Phthirusa Theobromae* Eichl. in Mart. Fl. Bras. 5, pt. 2: 56. *pl. 14.* 1868. *P. paniculata* Macbr. Field Mus. Bot. 11: 17. 1931.

Glabrous, erect or scandent, the bark grayish; petioles 5–10 mm. long; leaf blades ovate or ovate-lanceolate, somewhat acute, 3–10 cm. long, 3–7 cm. wide, coriaceous; flowers usually white, 4–6 mm. long, the perianth segments spreading, paniculate or the lower axillary spikes simple, the ternations sessile or subsessile; calyx membranous, truncate; fruit red, oblong.—Not at all clearly distinct and more or less typically represented by some of the following collections is var. **orinocensis** (Spreng.) Baehni & Macbr., comb. nov. (*Phthirusa orinocensis* [Spreng.] Eichl. op. cit. 60), with the ternations more or less pediceled and the racemes not at all panicled.

San Martín: Morales, *Williams 5693.* Zepelacio, 1,200–1,600 meters, *Klug 3605.* San Roque, 1,400 meters, *Williams 7064.*—Loreto: Iquitos, *Tessmann 3530, 5068; Williams 7976, 8095.* Mishuyacu, 100 meters, *Klug 3937.* Florida, 200 meters, *Klug 2134, 2047.* Mainas, *Poeppig 2383.*—Cuzco: Urubamba, *Weberbauer 5063* (flowers yellow). Widely distributed in tropical America. "Suelda con suelda," "pishco isman," "rochido-ey" (Huitoto name).

Struthanthus concinnus Mart. ex G. Don, Gen. Syst. 3: 411. 1834.

Branches long, slender, terete; petioles 3–6 mm. long; leaf blades lanceolate, acute at the base, gradually and acutely acuminate, 4–7 cm. long, 1.5–2.5 cm. broad, nearly nerveless, thin, dull beneath; ternations sessile or subsessile; flowers greenish yellow, the staminate to 6 mm., the pistillate to 4 mm. long; filaments affixed below the middle of the linear perianth segments; calyx denticulate; fruit ellipsoid.—*S. rubens* Mart. ex G. Don has coriaceous leaves lustrous on both sides, the lateral nerves obvious. The Peruvian specimens may be rather *S. sarmentosus;* at any rate, they are aberrant here by

reason of the pediceled flowers. Illustrated, Mart. Fl. Bras. 5, pt. 2: *pl. 24.*

Junín: Huacapistana, *Weberbauer 2157* (det. Patschovsky). Colonia Perené, 680 meters, *Killip & Smith 25058.* La Merced, 700 meters, *Killip & Smith 23507.* Chanchamayo Valley, 1,200 meters, *Schunke 331.* Above San Ramón, 1,300–1,700 meters, *Schunke A93.* Carpapata, 2,400 meters, *Killip & Smith 24366.* Huacapistana, 1,800–2,400 meters, *Killip & Smith 24314.*—Huánuco: Yanano, 1,800 meters, *3724.*—Ayacucho: Carrapa, 2,200 meters, *Killip & Smith 22310.* Brazil; Surinam.

Struthanthus dichotrianthus Eichl. in Mart. Fl. Bras. 5, pt. 2: 75. 1868.

Densely branched, the branches more or less scandent; petioles 3–10 mm. long; leaf blades oblong-lanceolate, obviously nervose beneath, attenuate at both ends, 2.5–7 cm. long, 1–3 cm. wide; ternations pedicellate, the pedicels 2–5 mm. long, in 2–3-chotomous, axillary umbels; bracts minute; flowers white, the larger staminate ones 5–6 mm. long; calyculus entire; fruit oblong, 5–6 mm. long, 3 mm. thick.—The Peruvian collection was determined apparently by Patschovsky.

Loreto: Puerto Limón, *Tessmann 4886.* Surinam and British Guiana; Venezuela.

Struthanthus Eichleri Baehni & Macbr., nom. nov. *Phthirusa polystachya* Eichl. in Mart. Fl. Bras. 5, pt. 2: 57. *pl. 19.* 1868, not *S. polystachyus* (R. & P.) G. Don.

Nearly *S. aduncus,* but the leaves rather less coriaceous, about 10 cm. long, the flowers all in simple, axillary spikes and, especially, the filaments slightly glandular, the anthers shortly produced.—Flowers purple (Ule). *S. nitens* (Mart.) Baehni & Macbr. would be sought here; its lustrous, narrowly ovate-lanceolate leaves are attenuately acuminate, its spikes solitary, the filaments eglandular, the anthers apiculate.

Río Acre: *Ule 9337* (det. Krause). Brazil.

Struthanthus lucarquensis (HBK.) Macbr., comb. nov. *Loranthus lucarquensis* HBK. Nov. Gen. & Sp. 3: 440. 1820. *Phthirusa lucarquensis* G. Don, Gen. Syst. 3: 421. 1834.

Much branched, the branchlets terete; leaves somewhat membranous and veiny, 2.5 cm. long, 18–20 mm. broad; flowers subsessile, 3 mm. long, whitish yellow; racemes only 6 mm. long; petals

4, oblong, acute, slightly concave; filaments membranous, nearly free; berry ovoid.—Because of the slender filament, this plant must belong to the group *Struthanthus*.

Peru(?): Lucarque (*Humboldt*). Ecuador.

Struthanthus orbicularis (HBK.) Blume ex R. & S. Syst. 7, pt. 2: 1731. 1850. *Loranthus orbicularis* HBK. Nov. Gen. & Sp. 3: 434. 1820.

A shrub with long, flexuous branches, these often pendent and twining, the young leaves prehensile; petioles 8–12 mm. long; blades more or less approaching orbicular, 2.5–5 cm. long, attenuate or contracted to the petiole, coriaceous; ternations subsessile in axillary spikes 2.5–10 cm. long, the rachis sharply quadrate; flowers yellowish green, to nearly 6 mm. long, more or less pediceled; bracts free, caducous; fruit oval, red, 1 cm. long.—Here would key *Tessmann 3248* with more elliptic leaves, from the Ucayali; the ternations are pedicellate, the racemes only 1–2 cm. long.

San Martín: Rioja, west of Moyobamba, *Weberbauer 4702;* 290 (det. Patschovsky). Brazil, north to Central America.

Struthanthus platycladus (Ule) Baehni & Macbr., comb. nov. *Phthirusa platyclada* Ule, Verh. Bot. Ver. Brandenb. 48: 153. 1907.

Similar to *S. pyrifolius*, to which it could be joined as a variety; leaves coriaceous, rounded-obtuse, mucronate; flowers 2–3 mm. long, yellowish green; fruit ascending-spreading.—Perhaps all the Peruvian material is rather referable to *S. pyrifolius*.

San Martín: Tarapoto, *Williams 5711*.—Loreto: Yurimaguas, *Williams 4984*. Middle Río Blanco, *Tessmann 3141*. Brazil. "Pishco isman."

Struthanthus polystachyus (R. & P.) G. Don, Gen. Syst. 3: 410. 1834. *Loranthus polystachyus* R. & P. Fl. 3: 50. 1802.

Branches long, terete, the branchlets more or less compressed at the nodes; petioles 1–1.5 cm. long; blades broadly ovate, acuminate, acute at the base, to 15 cm. long, 7 cm. wide, perfectly opaque, coriaceous, cartilaginous-margined, obviously finely reticulate-veined on both sides; spikes 2 or more together, to 6 cm. long, the rachis angled; ternations 5–7 mm. apart; bractlets inconspicuous; flowers tiny, purple; fruit oval, brownish yellow, 6 mm. thick.—Flowers lacking in the Madrid material. Neg. 29465.

Huánuco: Muña, Pillao, Panao, Pati, Chinchao, *Ruiz & Pavón*.

Struthanthus pyrifolius (HBK.) G. Don, Gen. Syst. 3: 413. 1834. *Loranthus pyrifolius* HBK. Nov. Gen. & Sp. 3: 441. 1820. *Phthirusa pyrifolia* Eichl. in Mart. Fl. Bras. 5, pt. 2: 63. *pl. 17.* 1868.

Branchlets compressed, more or less reddish-scurfy but soon glabrous; petioles rarely 10 mm. long; blades ovate-lanceolate, often acuminate, scarcely coriaceous, distinctly nervose, about 10 cm. long and half as wide or smaller; ternations of red-brown perfect flowers sessile or subsessile in axillary spikes or rarely in a terminal panicle (var. **terminalis** Macbr., comb. nov.; *P. pyrifolia* var. *terminalis* Macbr. Candollea 5: 349. 1934); calyx obsoletely denticulate; perianth segments 6, narrowly lanceolate, 1.5–2 mm. long; filaments short; fruit oblong, red.—The name is sometimes modernized or corrected to read *"pirifolius."* **S. rufus** (Mart.) Macbr. (comb. nov.; *Loranthus rufus* Mart.) has dioecious flowers 5–6 mm. long, borne in a terminal panicle. Also to be expected are **S. micranthus** (Eichl.) Baehni & Macbr. (comb. nov.; *Phthirusa micrantha* Eichl.) and **S. phaeoclados** (Eichl.) Baehni & Macbr. (comb. nov.; *Phthirusa phaeoclados* Eichl.), both with usually 4-merous flowers and sessile anthers, the former with them in axillary glomerules, the latter in axillary spikes, the leaves emarginate and 5–7-plinerved. **S. santaremensis** (Eichl.) Baehni & Macbr. (comb. nov.; *Phthirusa santaremensis* Eichl.), similar, has pinnately nerved leaves.

San Martín: San Roque, 1,400 meters, *Williams 7482* (type of var. *terminalis* Macbr.). Morales, *Williams 5711.* Rumizapa, *Williams 6790* (toward *S. platycladus*).—Amazonas: Chachapoyas, *Weberbauer 4458.*—Junín: Colonia Perené, 680 meters, *Killip & Smith 24996, 25071.* Río Perené, 600 meters, *Killip & Smith 25716.* La Merced, 600 meters, *5337.*—Loreto: Iquitos, *Ule 6249* (flowers purple); *Williams 3584; Killip & Smith 27310.* Caballo-cocha, *Williams 2257.* La Victoria, *Williams 2695.* Puerto Arturo, *Williams 4984.* Tropical South America to Central America. "Suelda con suelda," "pishco isman."

Struthanthus retroflexus (R. & P.) G. Don, Gen. Syst. 3: 415. 1834. *Loranthus retroflexus* R. & P. Fl. 3: 49. *pl. 279.* 1802.

Stoutly branched, the branches terete; petioles nearly 1.5 cm. long; leaves broadly elliptic or oval, about 10 cm. long, dull or nearly so, coriaceous, cartilaginous-margined, very faintly veiny on both sides, acute at both ends; panicles axillary and terminal, to 15 cm. long, the ternation pedicels scarcely 2 mm. long; rachis minutely papillose, angled; bractlets persistent, broadly ovate; flowers sessile,

tiny; fruit oval, nearly 10 mm. long, 6 mm. thick.—The type at Madrid has been referred by Krause, following Eichler's suggestion. to *S. marginatus* (Desr.) Blume, var. *paniculatus* Eichl. That Brazilian species, however, seems to be uniformly a much more slenderly branched plant, with typically narrower, thinner leaves. Neg. 29466.

Huánuco: Chinchao, Macora, *Ruiz & Pavón.*

Struthanthus retusus (Cham. & Schlecht.) Blume ex R. & S. Syst. 7, pt. 2: 1731. 1830. *Loranthus retusus* Cham. & Schlecht. Linnaea 3: 215. 1828. *L. polyrrhizos* Mart. ex R. & S. Syst. 7, pt. 1: 139. 1829. *S. polyrrhizos* Mart. ex Don, Gen. Syst. 3: 412. 1834.

Scandent, flexuous, branched; petioles 8–12 mm. long; leaves obovate-suborbicular, 2.5–3 (–5) cm. long, 0.5–3 cm. broad, usually marginate, sometimes deeply so, coriaceous; ternations in axillary, peduncled corymbs, more or less pedicellate; flowers greenish yellow, 4–6 mm. long, the pedicels of the pistillate ones as long, those of the staminate shorter; fruit ovoid-oblong, under 6 mm. long.—The Peruvian collection is apparently determined by Patschovsky, as "aff. *polyrrhizus*"; but see remark under *S. orbicularis.*

Loreto: Middle Río Ucayali, *Tessmann 3298.* Brazil.

Struthanthus sarmentosus (R. & P.) Blume ex R. & S. Syst. 7, pt. 2: 1731. 1830. *Loranthus sarmentosus* R. & P. Fl. 3: 49. *pl. 278.* 1802.

Similar to *S. acuminatus,* but the shorter branchlets nearly terete, the leaves more shortly acuminate, thin and distinctly veiny, dull beneath, lustrous above, clearly acute at the base or slightly decurrent on the slender petiole, this about 1 cm. long; terminal racemes panicled.—The Killip and Smith material has been referred to *S. concinnus* Mart., but as its flower clusters are pedicellate, it rather belongs here or to *S. tenuis* Patsch., but the petioles are only 4–5 mm. long. Neg. 27839.

Huánuco: Muña, *Ruiz & Pavón;* at 2,100 meters, *4019.*—Junín: Huacapistana region, *Killip & Smith 24314, 24366.*—Loreto: Caballo-cocha, *Williams 2144.*—Ayacucho: Carrapa, *Killip & Smith 22310.* "Liga."

Struthanthus tenuis Patsch. Bot. Jahrb. 45: 438. 1911.

Slender-stemmed, the internodes to 10 cm. long; petioles 1 cm. long; leaves broadly ovate-lanceolate, acuminate, 5–6 cm. long, 3.5 cm. wide; bractlets lanceolate, 2 mm. long; filaments medially

adnate to the greenish perianth segments.—This is probably to be included in *S. sarmentosus* (R. & P.) Blume.

Junín: La Merced, 1,000 meters, *Weberbauer 1948*, type; 283.

52. SANTALACEAE. Sandalwood Family

Reference: Pilger, Pflanzenfam. ed. 2. 16b: 52–91. 1935.

The source of sandalwood and oil, the family is outstanding in Peru in no respect unless by the contrast between its representatives there: a genus of small trees strikingly reddish-pubescent, and two genera of inconspicuous herbs.

Woody plants with oval, more or less pubescent leaves. 1. *Cervantesia.*

Herbs.

Bractlets not united; plants diminutive, creeping, the hidden stems yellow..... 2. *Arjona.*

Bractlets united to form a cup; erect or ascending plants. 3. *Quinchamalium.*

1. CERVANTESIA R. & P.

Casimiroa Dombey ex Baill. Adansonia 3: 126. 1862–3.

Small trees with elliptic leaves that are pubescent, especially beneath, as well as the branchlets and the terminal or subterminal flower clusters. Tube of the perianth shortly campanulate above the ovary.—Named for Vicente Cervantes, Mexican botanist.

Cervantesia bicolor Cav. Icon. 5: 49. *pl. 475.* 1799.

Similar to *C. tomentosa*, but the branchlets and leaf pubescence beneath a dense tomentum of reddish, crisped or crinkly hairs; leaves 5–8 cm. long, mostly 5–6 cm., 2–2.5 cm. broad; perianth segments rounded or subacute.

Lima: Obrajillo and San Buenaventura, *Née.* Ecuador.

Cervantesia tomentosa R. & P. Prodr. 39. *pl. 7.* 1794; Fl. 3: 19. *pl. 24.* 1802.

Branchlets and leaves beneath yellowish or somewhat rusty, pilose or lanuginose with long, more or less flexuous hairs, especially those of the leaves; leaves soon lustrous and glabrous above, mostly 9–10 cm. long, 2–2.5 cm. broad; young leaves and inflorescences densely red-pilose, the small flower parts hidden in the abundant pubescence; perianth segments acute, persistent and nearly enclosing the acorn-like fruits, these about 1 cm. long, 8 mm. thick.—A

shrub of 8 meters, with fiery red fruits (Weberbauer). *C. glabrata* Stapf, Kew Bull. 1906: 76. 1906, of Ecuador, has glabrate, elliptic leaves only 3–4 cm. long. Neg. 27874.

Junín: (*Ruiz & Pavón*). Huasa-huasi, *Ruiz & Pavón*, type; also, according to Ruiz & Pavón, at Huarocheri and Canta. Chanchamayo, *Isern 2395*.—Lima: Chorrillos, *Raimondi*.—Libertad: Otuza, *Weberbauer 6989*.

2. ARJONA Cav.

Reference: Skottsberg, Svensk Bot. Tidskr. 10: 520–528. 1916.

Herbs with underground stems or rhizomes, alternate, linear or linear-lanceolate leaves, and one to several terminal or subterminal, white, lilac, or purplish red flowers. Tube of the perianth elongate above the ovary. Placenta thick and short.—The name has been written variously since its publication as above, in honor of Francisco Arjona, a teacher of botany at Cádiz.

Arjona glaberrima Pilger, Bot. Jahrb. 37: 398. 1906.

Rhizomes branching, remaining attached to the original plant from which rise the 1–2-flowered branches, these scarcely more than 2 cm. long or much shorter; leaves 2–3 mm. long; flowers glabrous, purplish, the tube 6 mm. long, the lanceolate lobes 1.5–2 mm. long.—In wet cushions of *Distichia*, etc. Neg. 14343.

Lima: At 4,500 meters, *Weberbauer 5157*.

3. QUINCHAMALIUM Juss.

Low herbs, often branched at the caudex, from thick roots. Flowers mostly terminally aggregate, yellowish green to brown or reddish brown.—Regarding the name see Pilger, op. cit. 90, in footnote. As this author remarks, "The species are nearly related, difficult to separate"; perhaps, it may be added, the species are in reality rather forms or races of fewer variable or unstabilized specific entities.

Anthers barely exserted from the tube.....*Q. brevistaminatum.*

Anthers well exserted to at least a third the length of the lobes.

Leaves 3–4 (–5) mm. long; perianth tube 5–6 mm. long.
Q. Stuebelii.

Leaves mostly longer; flowers often 7–8 mm. long.

Perianth segments cucullate at the tip.

Leaves 5–9 mm. long; flowers apparently reddish from anthesis.....*Q. Raimondii.*

Leaves mostly 1–2 cm. long; flowers at anthesis yellowish green.....*Q. procumbens.*

Perianth segments plane at the tip or merely curved-apiculate.

Leaves 1.5–2.5 mm. broad.....*Q. lomae.*

Leaves scarcely 1 mm. broad.

Stems several dm. long.....*Q. elongatum.*

Stems rarely 20 cm. long.....*Q. Hoppii.*

Quinchamalium brevistaminatum Pilger, Notizbl. Bot. Gart. Berlin 10: 1030. 1930.

Stems ascending, about 10 cm. long, sparsely leafy; leaves linear or narrowly lanceolate, 1–1.5 cm. long, 1–3 mm. broad; calyculus subglobose, 2 mm. across; perianth tube narrow, 4–6 mm. long, the divisions scarcely longer than 2 mm.; style slightly, the stamens scarcely exserted from the tube; anthers nearly 1 mm. long, subsessile. —Flowers at first greenish yellow, later reddish brown.

Lima: Loma formation, railway to San Agustín, 300–400 meters, *Weberbauer 5718*, type.

Quinchamalium elongatum Pilger, Notizbl. Bot. Gart. Berlin 10: 1031. 1930.

Similar to a robust plant of *Q. procumbens*, but the leaves nearly filiform and the fruiting racemes to 3 cm. long; perianth tube 8.5–10 mm. long, the divisions 3–4 mm. long; anthers 1.5–2 mm. long. Neg. 14352.

Ancash: Ocros, 2,400 meters, *Weberbauer 2661*, type. Between Samanco and Huarás, 3,000–3,400 meters, *Weberbauer 3122;* 171.

Quinchamalium Hoppii Pilger, Notizbl. Bot. Gart. Berlin 10: 1030. 1930.

Not clearly distinct from *Q. elongatum* unless somewhat smaller in all its parts; stamens attaining three-fourths the length of the perianth divisions. Neg. 14354.

Arequipa: At 3,000–3,500 meters, *Hopp 56.*

Quinchamalium lomae Pilger, Notizbl. Bot. Gart. Berlin 10: 1030. 1930.

Branches to 30 cm. long, the leaves finally attaining 2 cm.; perianth tube 7–10 mm. long, the divisions at least 3 mm. long; anthers 1.5 mm. long.—Allied by the author with *Q. majus* Brongn.

(*Q. chilense* var. *majus* Speg.) with shorter perianth divisions in proportion to the tube. Neg. 14356.

Arequipa: Loma formation, between Atiquipa and Chala, 280 meters, *Weberbauer 7187*, type.

Quinchamalium procumbens R. & P. Fl. 2: 1. *pl. 107b*. 1799. *Q. linifolium* Meyen ex Walp. Nov. Act. Nat. Cur. 19: Suppl. 1: 1412. 1843, fide Pilger.

Stems few to many, a few cm. to 20–30 cm. long, procumbent-ascending to suberect from a woody caudex surmounting the stout taproot; leaves 1–2 or sometimes 3 cm. long, about 1 cm. wide, glabrous; calyculus scarcely 2 mm. thick; flowers soon reddish brown, the tube 5–6 mm. long, the anthers reaching to about one-half the length of the (2 mm. long) perianth divisions, these apically cucullate; anthers 1.5 mm. long.—An earlier name may be *Q. chilense* Lam. Encycl. Ill. 2: 142. *pl. 125*. 1797, or a more suitable, var. *procumbens* (R. & P.) Kuntze, Rev. Gen. 3: 284. 1893, but to judge from the Lamarck illustration of the type by Jussieu, the name might as well apply to some other species, as for instance to *Q. brevistaminatum*. Other names which may apply to the Peruvian forms include *Q. ericoides* Brongn., *Q. Dombeyi* Brongn., and *Q. gracile* Brongn. in Duperr. Voy. Coq. Bot. 231. *pl. 52*. 1826–1829, the last Latin name used repeatedly by Weberbauer for the Peruvian plant. It has been treated also as *Q. chilense* var. *gracile* (Brongn.) Hook. (fide Kuntze). The Ruiz and Pavón localities were given as Huarocheri, Canta, Tarma, and Concepción. The above description is drawn from the Madrid type, without locality.

Ayacucho: Below Coracora, 2,600 meters, *Weberbauer 5793*. Chavina, 3,300 meters, *Weberbauer 5783*. Ayacucho, *Weberbauer 5524*.—Lima: Chilca, Casapalta (*Ball*, as *Q. ericoides*). Obrajillo, *Née*. Canta, 3,100 meters, open bank, *Pennell 14599*. San Buenaventura, 2,700 meters, open slopes, *Pennell 14501*. Quebrada de San Mateo, *Isern 2077*.—Piura: Huaitara, 2,700 meters, *Weberbauer 5412*.—Cuzco: *Herrera*. Urubamba, 3,500–3,700 meters (Weberbauer 181).—Puno: Pisacoma (*Meyen*, type of *Q. linifolium*). Bolivia. "Quinchamoli," "chinchimali," "chinchinami."

Quinchamalium Raimondii Pilger, Notizbl. Bot. Gart. Berlin 10: 1031. 1930.

Branches divaricately spreading; leaves less than 1 mm. broad; calyculus 2 mm. thick; perianth divisions 3 mm. long, apically short-cucullate, the stamens reaching to about three-fourths their

length, the anthers 1.75 mm. long.—This seems to be the same as *Q. procumbens* or possibly *Q. gracile* Brongn. Neg. 14360.

Lima: *Raimondi.*

Quinchamalium Stuebelii Hieron. Bot. Jahrb. 21: 306. 1896.

Annual, the branches to 2.5 cm. long; leaves papillose, puberulent, mucronate; calyculus 2 mm. long, the larger teeth nearly 0.5 mm. long; perianth divisions 2 mm. long, scarcely half as wide, the stamens shorter, the style equaling the latter. Neg. 14361.

Puno(?): Tomarapé, 4,200 meters, *Stuebel 112a.* Bolivia.

53. OPILIACEAE. Opilia Family

By Paul C. Standley

Trees or shrubs; leaves alternate, without stipules; flowers very small, racemose or paniculate, perfect or unisexual; calyx none or poorly developed, not accrescent in fruit; perianth segments 4–5, free or more or less united; stamens as many as the petals and usually opposite them, inserted upon the disk or at the base of the petals; disk 4–5-lobate; ovary free or sunk in the disk, 1-celled, 1-ovulate; fruit drupaceous.—Only one other genus of the family is known in America, in Venezuela.

1. AGONANDRA Miers

Slender shrubs or trees, usually glabrous or nearly so; flowers minute, dioecious, greenish, racemose, the racemes axillary or borne at defoliate nodes; calyx minute, cupular, 4-lobate; petals 4 in the staminate flower, the stamens 4, the filaments filiform, exserted; petals none in the pistillate flower; ovary glabrous, the stigma sessile, discoid.

Agonandra brasiliensis Miers, Ann. Nat. Hist. II. 8: 172. 1851, nomen; Benth. & Hook. Gen. Pl. 1: 349. 1862.

A slender tree of 4–8 meters or more, the branches and leaves glabrous, the bark pale; mature leaves subcoriaceous, on short or elongate petioles, oblong-elliptic or ovate, 4–9 cm. long, 2–4 cm. wide, gradually or abruptly acuminate, often long-acuminate, acute or obtuse at the base or often contracted and decurrent, the nerves obscure; racemes 1–5 cm. long, few- or many-flowered, slender, solitary or geminate opposite the leaves, usually densely and minutely puberulent, the pedicels 1–4 mm. long; petals 1.5–2.5 mm. long, green; drupes oval, red, about 1 cm. long. Neg. 19070.

Loreto: Mishuyacu, 100 meters, in forest, *Klug 397*. Bolivia and Brazil to Colombia.

The South American material referred to this species is decidedly variable in its more obvious characters, and it is quite probable that a careful revision, with ample material, will show that it is divisible into several species.

54. OLACACEAE. Olax Family

By Paul C. Standley

Trees or shrubs; leaves usually alternate and entire, penninerved, without stipules; inflorescence commonly axillary and few-flowered, the flowers solitary, fasciculate, cymose, or racemose, small, greenish or white, regular, perfect or unisexual; calyx small, with 4–6 teeth or lobes, sometimes accrescent in fruit; petals 4–6, free or more or less united, valvate or slightly imbricate; stamens 4–12, inserted with the petals and more or less adnate to them, all fertile or partly sterile, the filaments free or rarely monadelphous, the anthers 2-celled; disk various; ovary free, 1-celled or imperfectly 3–5-celled; ovules usually 2 or 3; fruit drupaceous, commonly 1-celled and 1-seeded.

Calyx in fruit becoming greatly enlarged and brightly colored, often flat and rotate. Stamens twice as many as the petals; flowers fasciculate in the leaf axils.....1. *Heisteria.*

Calyx little or not at all enlarged in fruit, not brightly colored.

Stamens free, fewer than the petals. Petals 5–6.....2. *Liriosma.*

Stamens united to form a tube, of the same number as the petals.

Stamens united to form a tube about the style....3. *Schoepfia.*

Stamens united with the petals.....4. *Aptandra.*

1. HEISTERIA Jacq.

Glabrous trees or shrubs with entire, membranaceous or coriaceous, short-petiolate leaves; flowers minute, short-pedicellate or sessile, fascicled in the leaf axils; calyx minute, 5–6-dentate or lobate, in fruit greatly enlarged and persistent, erect and enclosing the fruit or often reflexed and exposing it, usually red or purple, subentire to deeply lobate; petals small, more or less villous within; stamens usually 10–12, rarely 5–6, hypogynous or adnate at the base to the petals; ovary depressed-globose, 3-celled; fruit a drupe, globose or oblong, the flesh thin, the endocarp crustaceous.

Fruiting calyx lobate almost to the base, much longer than the drupe..... *H. cauliflora.*

Fruiting calyx subentire or only very shallowly lobate, usually shorter than the drupe, often reflexed or at least not enclosing the fruit.

Fruit globose or depressed-globose, as broad as long or broader.

Calyx spreading in fruit; leaves acute at the base... *H. pallida.*

Calyx abruptly reflexed in fruit; leaves obtuse or rounded at the base..... *H. eurycarpa.*

Fruit ellipsoid or oval, conspicuously longer than broad.

Fruiting calyx conspicuous, spreading, more than half as long as the fruit..... *H. cyanocarpa.*

Fruiting calyx inconspicuous, erect, less than one-third as long as the fruit..... *H. densifrons.*

Heisteria cauliflora Smith in Rees, Cycl. 17: No. 2. 1819.

A shrub or tree 3–10 meters high; leaves short-petiolate, coriaceous, blades variable, chiefly oblong or oblong-lanceolate, 8–25 cm. long, acute to obtuse or narrowly rounded at the base, long-attenuate to the apex, lustrous; flowers clustered in the leaf axils or on naked branches below the leaves, short-pedicellate or subsessile; pedicels in fruit usually short but sometimes much elongate; calyx in flower minute, dentate; petals whitish, 2.5 mm. long; fruiting calyx pink or red, usually 2 cm. long or more, spreading or rather closely enclosing the fruit, lobed almost to the base, the lobes obtuse; drupe oval or rounded-oval, about 1 cm. long, longer than broad. Neg. 27860.

Junín: Chanchamayo, *Isern 2171.*—Loreto: Río Itaya, *Mexia 6477.* Timbuchi, Alto Río Nanay, in forest, *Williams 996, 1034.* Río Masana, *Williams 18, 98, 25, 26, 27, 8160.* Mishuyacu, near Iquitos, 100 meters, *Klug 385, 326, 1363, 906.* Pinto-cocha on the Río Nanay, *Williams 834, 798, 836, 834.* Iquitos, 100 meters, in forest, *Williams 8058; Killip & Smith 27188, 27190.* La Victoria, on the Amazon River, *Williams 2957.* Forest between Río Nanay and Río Napo, *Williams 698.* Puerto Arturo, Yurimaguas, edge of forest, *Williams 5191.* Fortaleza, Yurimaguas, in forest, *Williams 4248.* Recreo, Yurimaguas, in forest, *Williams 4161.* Yurimaguas, 135 meters, in forest, *Killip & Smith 27696.*—Without locality: *Ruiz & Pavón 14–52.*—San Martín: Zepelacio, *Klug 3305.* Also in the Guianas and doubtless in Amazonian Brazil. "Platina-caspi," "huangana caspi."

The numerous specimens exhibit remarkable variation in the form of their leaves, but they appear to be uniform in fruit characters, and these alone seem to be dependable for limitation of species. One or two of the numbers listed perhaps do represent distinct species, so far as one may judge from leaf form, but unfortunately they do not bear fruits.

Heisteria cyanocarpa P. & E. Nov. Gen. & Sp. 3: 35. *pl. 241.* 1845; Engl. in Mart. Fl. Bras. 12, pt. 2: 17. *pl. 5, f. 2.* 1872. *H. nitida* Engl. op. cit. 18. 1872.

A shrub or tree 3–9 meters high; leaves short-petiolate, the blades somewhat coriaceous, lance-oblong to narrowly elliptic, mostly 10–20 cm. long but often larger, obtuse to acute at the base, long-attenuate to the apex, usually lustrous; flowers clustered in the leaf axils, the pedicels about 2 mm. long, in fruit equaling or shorter than the calyx; calyx in flower 1 mm. long, 5-dentate; petals whitish, lanceolate, 3 mm. long; fruiting calyx red, orbicular, 1 cm. long or less, subentire, usually reflexed; drupe blue, about 1 cm. long. Negs. 27861, 27865.

Loreto: Balsapuerto, *Klug 2899.* Río Putumayo, *Klug 1607.* Florida, *Klug 2161.* Río Santiago, *Mexia 6183.* Type from Yurimaguas, Mainas, *Poeppig.* La Victoria, on the Amazon, *Williams 2949, 2745, 2805, 2808.* Caballo-cocha, on the Amazon, *Williams 2038.* Leticia, on the Amazon, *Williams 3169.* Pebas, on the Amazon, in forest, *Williams 1572, 1741.* Lower Río Nanay, in jungle, *Williams 477.* Río Masana, in forest, *Williams 86.* Río Marañón, near mouth of Río Tigre, 115 meters, wooded bank, *Killip & Smith 27513, 27536.* Huallaga, Yurimaguas, *Williams 4661.* Mishuyacu, near Iquitos, 100 meters, *Klug 1138, 414, 1038; Killip & Smith 29942.* Yurimaguas, *Killip & Smith 27691.* Wooded banks of Río Itaya, above Iquitos, 110 meters, *Killip & Smith 29396.* Iquitos, *Killip & Smith 27399.*—Without locality: *Ruiz & Pavón 14–54.* Also in the Amazon Valley of Brazil. "Cotoma masacey" (Huitoto name).

The type of *H. nitida* is *Spruce 4148* from Tarapoto. I have seen no material of that number, but the characters upon which the species was separated from *H. cyanocarpa* do not appear to be of taxonomic importance.

Heisteria densifrons Engl. in Mart. Fl. Bras. 12, pt. 2: 17. *pl. 5, f. 1.* 1872.

A glabrous tree; leaves short-petiolate, ovate to elliptic-oblong, 7–17 cm. long, 3–6 cm. wide, rather abruptly long-acuminate, acute

at the base; flowers few, the pedicels very short and thick; calyx in anthesis minute, urceolate, very shallowly denticulate, in fruit accrescent and cyathiform, about 3 mm. long; fruit obovoid, broadly rounded at the apex, almost 1 cm. long. Neg. 19085.

Loreto: Paraíso, Alto Río Itaya, 145 meters, *Williams 3379*. Amazonian Brazil. "Parinari" (perhaps an erroneous name).

Heisteria eurycarpa Standl. Field Mus. Bot. 11: 148. 1936.

A shrub; leaves short-petiolate, the blades subcoriaceous, elliptic or oblong-elliptic, 5–9 cm. long, rounded or very obtuse at the base, abruptly narrow-acuminate at the apex, lustrous; flowers densely clustered in the leaf axils, the pedicels very short; fruit depressed-globose, much broader than high, about 1 cm. wide; fruiting calyx apparently green, abruptly reflexed, shallowly lobate, the lobes obtuse.

Loreto: La Victoria, on the Amazon River, in forest, *Williams 2719*, type.

Heisteria pallida Engl. in Mart. Fl. Bras. 12, pt. 2: 16. 1872.

A medium-sized tree; leaves short-petiolate, subcoriaceous, the blades oblong or lance-oblong, 9–13 cm. long, obtuse or acutish at the base, narrowed to the bluntly short-acuminate apex, lustrous; pedicels in flower mostly 5–9 mm. long, in fruit longer than the petiole; fruiting calyx 1 cm. long, spreading, membranaceous, indistinctly lobate; drupe globose, 1 cm. in diameter, pruinose. Neg. 27865.

San Martín: Type collected near Tarapoto, *Spruce 4531*. Tarapoto, in forest, *Williams 6719, 5966, 5813*. "Chuchuhuasha," "huaami chuchu huasha."

2. LIRIOSMA P. & E.

Trees or shrubs with slender branches, glabrous or somewhat pubescent; leaves at first very thin, becoming membranaceous or subcoriaceous; flowers very small, in short or somewhat elongate, simple or branched, axillary racemes; calyx minute, cupuliform, truncate, the limb somewhat accrescent in fruit; petals 6, connate to the middle; fertile stamens 3, the filaments lanate, becoming glabrate; sterile stamens 6, spatulate, bifid at the apex; ovary 3-celled at the base, 3-ovulate; fruit drupaceous, 1-seeded.

Leaves finely puberulent beneath, soft to the touch....*L. adhaerens.*

Leaves glabrous.

Petals glabrous outside.....*L. gracilis.*

Petals puberulent or pilosulous outside.....*L. Spruceana.*

Liriosma adhaerens Spruce ex Engl. in Mart. Fl. Bras. 12, pt. 2: 26. *pl. 6, f. 3.* 1872.

A slender shrub of 2–3.5 meters, the branches sometimes elongate and somewhat trailing, minutely puberulent or glabrate, green; leaves short-petiolate, thin, oblong-ovate to broadly ovate, 5–9 cm. long, 2.5–4 cm. wide, acute or acuminate, acutish to rounded at the base, glabrous above or nearly so, minutely soft-puberulent beneath; racemes short, longer than the petioles, few-flowered, flexuous, puberulent throughout, the pedicels 2 mm. long; petals 6 mm. long; fruit apparently oval, red, 2.5 cm. long. Negs. 21938, 19072.

Junín: Puerto Bermúdez, 375 meters, in forest, *Killip & Smith 26475, 26664;* flowers green or white.—Loreto: Manfinfa, Alto Nanay, *Williams 1109.* Yurimaguas, in forest, *Williams 4748.*—San Martín: Tarapoto, *Spruce 4207,* type collection; *Williams 6632, 5520, 6315.* Amazonian Brazil, and reported from Rio de Janeiro.

Liriosma gracilis A. C. Smith, Bull. Torrey Club 58: 91. 1931.

A slender shrub or tree 1–5 meters high, sometimes with elongate, clambering branches, the branchlets glabrous or sparsely puberulent; leaves short-petiolate, ovate or oblong-ovate, mostly 6–8.5 cm. long and 2.5–4.5 cm. wide, acute or acuminate, acute to rounded at the base, rather thick, glabrous or practically so; racemes 3–6-flowered, little exceeding the petioles, the rachis minutely pilose; petals 6–7 mm. long, glabrous; fruit ellipsoid, about 2 cm. long.—The flowers are described as white, yellow, or orange-yellow, the fruit as orange-yellow.

Loreto: Mishuyacu, in clearing, 100 meters, *Klug 44,* type collection; *848, 851, 1557.* Lower Río Nanay, *Williams 659.* Iquitos, 100 meters, in forest, *Killip & Smith 27320.* Morona-cocha, 115 meters, in second-growth, *Mexia 6513.* Florida, 200 meters, in forest, *Klug 2014, 2242.* "Senimoro-ey" (Huitoto name).

Liriosma Spruceana Engl. in Mart. Fl. Bras. 12, pt. 2: 24. 1872.

A slender shrub or tree, 5.5 meters high or less, the green branches glabrous or nearly so, often much elongate; leaves thin or rather thick, short-petiolate, ovate or oblong-ovate, 7–15 cm. long, 3.5–8 cm. wide, acuminate, acute or obtuse at the base; racemes short or elongate, flexuous, glabrous, mostly 6–8-flowered, the pedicels 4–5 mm. long; flowers 5 mm. long; fruit ellipsoid, 2 cm. long. Neg. 27871.

Loreto: Puerto Arturo, 200 meters, in forest, *Williams 5055, 5008, 5304.* La Victoria, in forest, *Williams 2532.* Florida, 180 meters, in forest, *Klug 2293;* flowers white. Iquitos, 100 meters, *Killip & Smith 26990;* fruit pale orange.—San Martín: Mount Guayrapurina, near Tarapoto, *Spruce 4884,* type.

3. SCHOEPFIA Schreb.

Shrubs or small trees; leaves glabrous, membranaceous or coriaceous; flowers few, in short, axillary racemes; calyx small, cupular, obscurely 5-denticulate, unchanged in fruit; petals 4–6, inserted on the margin of the disk, united for most of their length, with a fascicle of hairs within above the middle; stamens as many as the petals and opposite them, the filiform filaments adnate to the corolla for almost their whole length; ovary partially 3-celled, 3-ovulate; fruit drupaceous, enclosed except at the apex in the accrescent disk, 1-seeded.

Schoepfia flexuosa (R. & P.) R. & S. Syst. Veg. 5: 160. 1819. *Haenkea flexuosa* R. & P. Fl. 3: 8. *pl. 231.* 1802.

A glabrous shrub or small tree, as much as 5 meters high, with more or less flexuous branches; leaves somewhat coriaceous when dry, short-petiolate, narrowly or broadly ovate, about 6 cm. long and 4 cm. wide, acute, almost rounded to subacute at the base, the lateral nerves few and distant, the veins obsolete; racemes solitary or geminate, less than half as long as the leaves, few-flowered, the flowers almost sessile, each subtended by a small, ovate bract, 4–5-parted; perianth yellowish, about 6 mm. long, the segments united for somewhat more than half their length, the lobes spreading or reflexed, glabrous within; drupe said to be "as large as a chick-pea (*Cicer*)."

Huánuco: Type collected in the mountains of Pillao and near San Antonio de Playa Grande, *Ruiz & Pavón.* Without locality, *Ruiz & Pavón.* San Antonio de Playa Grande, *Ruiz & Pavón 29–59.*—Libertad: Hacienda Membrillal, 1,200–1,400 meters, *Weberbauer 6983.*

4. APTANDRA Miers

Small or large trees, glabrous throughout, with slender branches; leaves rather thin, acuminate; flowers in small, axillary panicles; calyx very small, patelliform, 4-dentate, fleshy, in fruit slightly accrescent and cupuliform, partly enclosing the fruit; petals 4, fleshy, almost linear, inflexed at the apex, finally reflexed and spirally convolute; disk composed of squamiform glands; stamens 4, the fila-

ments united to form a fleshy tube; ovary 1-celled, 1-ovulate.—One other species is known from Brazil, and another occurs in western Africa.

Flowers on long, slender pedicels.....*A. Spruceana.*
Flowers short-pedicellate or almost sessile.....*A. tubicina.*

Aptandra Spruceana Miers, Ann. Nat. Hist. II. 7: 202. 1851.

A small or medium-sized tree, reported to reach a height of 16 meters, with long, slender branches; leaves short-petiolate, oblong or elliptic-oblong, mostly 9–12 cm. long and 4–5 cm. wide, abruptly and narrowly obtuse-acuminate, acutish at the base; panicles broad, shorter than the leaves, the very numerous white flowers umbellate at the ends of the branches, the pedicels sometimes 2 cm. long but mostly much shorter; petals 3 mm. long; drupe globose, as much as 2 cm. in diameter.—Illustrated, Miers, Contr. Bot. 1: *pl. 1;* Mart. Fl. Bras. 12, pt. 2: *pl. 1, f. 2.* Neg. 19075.

Loreto: Santa Rosa, 200 meters, edge of forest, *Williams 4798.* San Ramón, Yurimaguas, 200 meters, in forest, *Williams 4550.* Timbuchi, edge of forest, *Williams 964.*—San Martín: Pongo de Cainarachi, 230 meters, in forest, *Klug 2698.* Amazonian Brazil. "Pamashto," "trompo huayo."

Aptandra tubicina (Poepp.) Benth. ex Miers, Ann. Nat. Hist. III. 4: 360. 1859. *Heisteria tubicina* Poepp. Nov. Gen. & Sp. 3: 35. *pl. 251.* 1845.

A small tree with slender, green branches; leaves short-petiolate, elliptic, 10–13 cm. long, 5–6 cm. wide, linear-attenuate at the apex; panicles one-fourth or one-third as long as the leaves, the flowers on pedicels only 1 mm. long, subracemose, the pedicels in fruit elongate and thickened; fruit blackish, ovoid-globose, 2.5 cm. long.—Illustrated (flower), Mart. Fl. Bras. 12, pt. 2: *pl. 1, f. 1.*

Loreto: Type collected in forest near Yurimaguas, *Poeppig.* Amazonian Brazil.

55. BALANOPHORACEAE. Balanophora Family

Reference: Harms, Pflanzenfam. ed. 2. 16b: 296–339. 1935.

Fleshy, yellowish or red root parasites that at least superficially suggest some strange fungus rather than a flowering plant. A Brazilian species, *Lophophytum mirabile* Schott & Endl. (illustrated, Pflanzenfam. ed. 2. 16b: 325), that reminds one of a sea-anemone as much as of a plant, and is represented in Peru by a variety, has

the local reputation of endowing with magical power (Harms). The rhizomes often bear or are more or less enveloped in gall-like structures of symbiotic character; cf. Strigl, Sitzungsber. Akad. Wiss. Wien 1127–1172. 1908.

Rhizomes scaly, with deciduous bracts, the elongate flower body basally bracteate; perianth lacking.....1. *Lophophytum.*

Rhizomes ebracteate.

Flower body without imbricate bracts.

Flowers borne externally; perianths lacking.

Staminate flowers on the upper part of the flower body. 2. *Ombrophytum.*

Staminate flowers on the lower part of the flower body or absent.....3. *Juelia.*

Flowers sunk in hair-like paleae, the staminate with a perianth.

Perianth 3-parted; flower body often oval.....5. *Helosis.*

Perianth tubular; flower body often elongate...6. *Corynaea.*

Flower body bracteate, the bracts imbricate.....4. *Langsdorffia.*

1. LOPHOPHYTUM Schott & Endl.

Flower body devoid of a cup-like base, whitish to reddish violet.—Some medicinal use of the Brazilian species has been made, particularly in the treatment of rhachitis (Peckolt).

Lophophytum bolivianum Wedd. Ann. Sci. Nat. III. 14: 185. *pl. 10.* 1850.

Rhizomes lobed, the cone-like inflorescences 10–30 cm. long, sometimes half buried; staminate flowers red, hidden by the sharp, erect, brown bracts, the pistillate ebracteolate, 4–5 mm. long; styles exserted but deciduous in age.—Doubtfully distinct from *L. mirabile* Schott & Endl.; cf. Hook. f. Trans. Linn. Soc. 22: 48. 1856. Tessmann noted the color of the plants as reddish below, shading to light brown or white toward the tip.

Loreto: Mouth of Río Santiago, *Tessmann 4202* (det. Harms). Bolivia.

2. OMBROPHYTUM Poepp.

Allied to *Lophophytum,* but the stamens and pistils separately borne around a disk or knob-like structure, the flower body basally enclosed in a deep cup or volva; lacking the cone-like scales of the related genera, the plants are totally different in appearance, these suggesting an ear of maize. Styles short, falling promptly.—The

plants develop rapidly after a shower, enduring only a short time (the author therefore called them "rain plants"), or they are soon killed, like fleshy fungi, by insect larvae (Poeppig). The authority for the generic name is as given!

Anthers many.

Volva cup-like, 3-lobed.....*O. peruvianum.*

Volva entire, tube-like.....*O. zamioides.*

Anthers few, about 7.....*O. Ulei.*

Ombrophytum peruvianum P. & E. Nov. Gen. & Sp. 2: 40. *pl. 155.* 1838.

Yellowish, 10 cm. tall or taller, the broad volva more or less 3-lobed and as much as 10 cm. deep.—Illustrated, Pflanzenfam. 327.

Huánuco: Cochero (*Poeppig*).—Loreto: Upper Marañón (*Tessmann 3994*, det. Harms).—Río Acre: (*Ule*, fide Harms). Brazil. "Maíz del monte."

Ombrophytum Ulei Harms, Pflanzenfam. ed. 2. 16b: 328. *f. 165.* 1935.

Distinguished especially by the low staminate disk and the few stamens; volva narrow, entire.—Illustrated, Pflanzenfam. ed. 2. 16b: 327.

Río Acre: (*Ule*).—Loreto: Río Marañón above Pongo de Manseriche, 200 meters, *Mexia 6337a*, on floor in dense forest.

Ombrophytum zamioides Wedd. Ann. Sci. Nat. III. 14: 184. *pl. 10.* 1850.

Apparently like *O. peruvianum*, but smaller, the tubular volva entire.—Perhaps here belongs a similar violet-colored plant from Tocache which Poeppig mentions. Hooker f. suggests, Trans. Linn. Soc. 22: 50, that the plate of *O. peruvianum* by Poeppig and Endlicher is partly from memory, the differences of the Weddell plant, therefore, more apparent than real, and reduces the latter name. Only further collections can prove this assumption.

Peru(?): Prov. de las Cordilleras (*Weddell*).

3. JUELIA Asplund

Fleshy, the tuberous rhizome without scales. Flowers ebracteolate, chiefly pistillate, with staminate intermixed toward the base of the flower body. Stamens 2. Ovary 1-celled, destitute of free placentae as in *Ombrophytum* at first.

Juelia subterranea Asplund, Svensk. Bot. Tidskr. 22: 274. 1928.

Rhizome about 5 cm. thick; peduncular portion of the plant equaling or exceeding the volva; flowers rosaceous or pale rose; filaments 1–1.5 mm. long, the linear anthers twice as long; styles 1 mm. long.—The bracts are stiped, with a one-sided, pointed, peltate upper end. In the type only one per cent of 100–150 flowers were staminate. As the original locality is near the boundary of the Department of Puno, the plant in all probability grows also in Peru, with *Lepidophyllum quadrangulare* (Meyen) Benth. & Hook., the host plant.

Peru: (Probably). Bolivia.

4. LANGSDORFFIA Mart.

Rhizomes at first tomentulose, more or less contorted, bearing 1–3 egg-shaped inflorescences subtended by several imbricate rows of pointed bracts. Pistillate flowers imbedded in tissue, the free staminate ones with a 2–3-parted perianth.—Candles prepared from the rhizomes, which are rich in wax, are sold in the markets of Colombia under the name "siejos" (Harms).

Langsdorffia hypogaea Mart. in Eschwege, Journ. Bras. 2: 178. *pl. 5.* 1818.

Plants to several cm. high, the flower bodies 2–4 cm. in diameter; staminate flowers many, 8–12 mm. long.—On roots of palms and fig trees (*Ficus*). Illustrated, Pflanzenfam. ed. 2. 16b: 336. The citation has not been verified.

Huánuco: Cochero (*Poeppig*). Mexico to southern Brazil.

5. HELOSIS L. C. Rich.

Stipes of the roundish flower bodies raised from a short, cup-like base of the branching rhizomes. Staminate perianth 3-parted.—The name has been conserved.

Helosis cayennensis (Sw.) Spreng. Syst. 3: 765. 1826. *Cynomorium cayenense* Sw. Fl. Ind. Occ. 1: 13. 1797. *H. guyanensis* Rich. Mém. Mus. Hist. Nat. Paris 8: 416. *pl. 20.* 1822.

Flowering stipes 5–30 cm. long, the basal cup very short; flower body ovoid, 2–4 cm. long, the flowers blood-red and more or less exserted.—Plants bright yellowish or reddish yellow, or the stems purplish red. On Myrtaceae. Illustrated, Mart. Nov. Gen. & Sp. 3: *pl. 298, 300.*

Loreto: Mouth of Río Santiago, *Tessmann 4402.* Lower Río Napo, *Tessmann 3714.* Cumaría, *Tessmann 5077.* (All det. Harms.)

6. CORYNAEA Hook. f.

Similar to *Helosis* except as indicated.—Besides the following, the Colombian and Ecuadorian *C. Sprucei* Eichl. may occur in Peru; it may be known by its unisexual flower bodies. The genus is illustrated, Trans. Linn. Soc. 22: *pl. 13, 14.*

Corynaea Purdiei Hook. f. Trans. Linn. Soc. 22: 55. 1856.

Rhizome broad, flattened, lobed, sometimes several dm. long; stipes white, 2–2.5 cm. high, 12 mm. thick, bearing a subglobose or ovoid, bisexual flower body about 3.5 cm. thick, this at first white but soon covered with brown-red, hexagonal, peltate scales.—On *Cinchona* roots. The related species being Colombian, the locality as Peruvian may be questioned.

Peru(?): San Juan del Oro (*Weddell*). Colombia.

56. ARISTOLOCHIACEAE. Birthwort Family

Reference: O. C. Schmidt, Pflanzenfam. ed. 2. 16b: 204–242. 1935.

The penguin flower, *A. brasiliensis* Mart. & Zucc., with blossoms 15 cm. long, the lower lip as broad—Pflanzenfam. *f. 122c*—is cultivated at the Lima Botanic Garden (Killip) and may possibly be found in Peru.

1. ARISTOLOCHIA L.

References: Duchartre in DC. Prodr. 15, pt. 1: 432–498. 1864; Schmidt, Repert. Sp. Nov. 23: 282–299. 1927; 292–293. 1930; 30: 65–75. 1932.

The determinations of practically all recent collections are by Schmidt or have been verified by him. The reference numbers after the citations are to the treatment by Duchartre.

Leaves truncate at the base or very shallowly cordate.

Leaves subrotund, mostly more than 11 cm. wide (cf. *A. bicolor*).

Pubescence of the 5-nerved leaves beneath cobwebby.
A. maranonensis.

Pubescence of the 7-nerved leaves beneath merely crisped.

Flowers purple and blotched about the edge, yellow within, about 2 cm. wide at the tip.....*A. Pilgeriana.*

Flowers twice or thrice larger, purple-blotched within.
A. Ruiziana.

Leaves deltoid-ovate, mostly narrower than 10 cm. (cf. *A. bicolor*).
Leaves mostly very lightly cordate at the base, glabrous or the pubescence minute.
Stipules present (that is, here as elsewhere, pseudo-stipules).
Leaves glabrous, not sculptured beneath....*A. physodes.*
Leaves pubescent, subcircularly sculptured beneath.
A. deltoidea.
Stipules none.
Leaf nerves 7; leaves 11 cm. wide.....*A. bicolor.*
Leaf nerves 5; leaves 6–7 cm. wide.....*A. putumayensis.*
Leaves rounded-truncate at the base, crisp-pubescent beneath.
A. Guentheri.
Leaves distinctly cordate, usually cordately lobed, at the base.
Leaves glabrous beneath or the pubescence microscopic or confined, as in *A. Weberbaueri*, to the nerves.
Leaves ovate, pandurate or hastate.
Leaves pandurate; flowers large.....*A. pandurata.*
Leaves not pandurate, often ovate or subovate; flowers medium-sized.
Leaves deltoid-cordate; petioles to 4 cm. long.
A. Weberbaueri.
Leaves broadly hastate; petioles 5.5–7 cm. long.
A. mishuyacensis.
Leaves subrotund.
Leaf blades 10–20 cm. long.
Leaves concolorous; flowers about 5 cm. long.
Perianth lip wide and flaring, purple.....*A. floribunda.*
Perianth lip narrow, yellowish.....*A. cauliflora.*
Leaves glaucous beneath; flowers about twice as long.
A. didyma.
Leaf blades 4–8 cm. long.
Perianth lip rounded, flaring.....*A. elegans.*
Perianth lip split, narrow.....*A. lingulata.*
Leaves distinctly but often finely pubescent all over beneath.
Stems glabrous.
Width of leaves usually less than 8 cm. (4.5–8 cm.); flowers solitary.

Leaves oblongish, 15–18 cm. long; perianth limb bifid. *A. iquitensis.*

Leaves ovate-cordate, 7–10 cm. long; perianth limb entire. *A. Rimbachii.*

Width of leaves usually more than 8 cm. (6–18 cm.); flowers several.

Leaves gradually acuminate; flowers roseate. *A. peruviana.*

Leaves short-acuminate; flowers yellowish. *A. maranonensis.*

Stems pubescent.

Trichomes of the stems 1.2–2 mm. long, spreading.

Leaf pubescence beneath short, dense; perianth lip 2–3 cm. wide.

Leaves to 5 cm. long or longer, broadly ovate; perianth lip about 2 cm. wide..... *A. amazonica.*

Leaves often larger, ovate-deltoid; perianth lip wider. *A. truncata.*

Leaf pubescence beneath hirsutulous; perianth lip 8 mm. wide..... *A. pilosa.*

Trichomes appressed or short.

Trichomes subappressed; leaves sometimes pandurate.

Leaves pandurate..... *A. Burelae.*

Leaves not pandurate..... *A. Macbrideana.*

Trichomes spreading; leaves not pandurate.

Leaves velvety beneath, the sinus under 1 cm. wide; flowers several..... *A. asperifolia.*

Leaves more or less pubescent beneath, the sinus often broader; flowers solitary or binate.

Leaves 5 (–7)-nerved, scabrous or pubescent above; perianth limb short-acuminate.

Leaves deltoid, subobtuse..... *A. Killipiana.*

Leaves ovate, acuminate..... *A. fragrantissima.*

Leaves 3–5-nerved, glabrous above; perianth limb typically long-acuminate..... *A. Mathewsii.*

Aristolochia amazonica Ule, Verh. Bot. Ver. Brandenb. 47: 122. 1905.

Stems herbaceous, setose-pilose; petioles 3–5 cm. long; leaves sometimes 7 cm. long and nearly as wide, acute, glabrous above, shortly and densely tomentose beneath; flowers axillary, solitary, the pedicel with ovary 5–6 cm. long; perianth densely pilose, about 7 cm. long; tube slightly curved above the middle, cylindric, finally broadened and expanded to the one-lobed limb, this 2–2.5 cm. long; lip broadly elliptic, rounded-obtuse, to nearly 3 cm. long, pubescent within, with subulate processes.—Remarkable for the long (to 3 cm.) utricle. Flowers purple or olive with dark markings, the lip in the middle bright brown-yellow, at the tip thickly flecked with purple. Neg. 4896.

Loreto: Cainarachi, *Ule 6406*, type. Yurimaguas, 135 meters, in forest, *Killip & Smith 27583, 27996*. El Recreo, 200 meters, edge of forest, *Williams 3957*. Balsapuerto, 220 meters, in forest, *Klug 3042*.

Aristolochia asperifolia Ule, Verh. Bot. Ver. Brandenb. 47: 121. 1905.

A high-climbing vine with round and forking stems; petioles 3–4 cm. long, that is, little longer than the depth of the leaf sinus; leaves to 16.5 cm. long and 9 cm. broad, ovate-oblong, acuminate, above rough-pubescent, indistinctly 5-nerved; flowers 6–7 cm. long, green, in short racemes; tube 2.5 cm. long, pubescent without, ventricose-ovoid at the base, refracted, recurved, expanding above the middle to the cordate-ovate, acutely cuspidate limb, above densely glandular; capsule to 6.5 cm. long and 3.2 cm. thick; seeds triangular, broadly margined, verruculose.—Near *A. Sprucei* Mast., but distinguished by its rough leaves, narrowly cordate at the base. Neg. 4899.

San Martín: Tarapoto, *Ule 6502* (type). Alto Río Huallaga, *Williams 5653*.—Junín: La Merced, 600 meters, in thicket, *5459*.—Río Acre: *Ule 9340*. "Canastilla."

Aristolochia bicolor Ule, Verh. Bot. Ver. Brandenb. 47: 124. 1905.

Herbaceous, glabrous except for the grayish white, finely pubescent leaves beneath; petiole 5–7 cm. long; leaves triangular-acute, thin, dark green above, nearly silvery beneath (but the 7 nerves glabrous), 12–13.5 cm. long, 11–12.5 cm. wide; capsule rugose, ellipsoid, 5–6 cm. long; seeds 6 mm. long and 3 mm. broad, minutely pubescent, acute at the base, incised at the apex. Neg. 4900.

Loreto: Yurimaguas, *Ule*. Brazil.

Aristolochia Burelae Herzog, Medd. Rijks Herb. Leiden 40: 2. 1921.

Slender, the youngest stems, leaves on both sides, and flowers tomentose; petioles 1.5–2 cm. long or somewhat longer; leaves oblong-lanceolate or narrowly deltoid, acute, 5.5–12 cm. long, 3.5–8.5 cm. wide, 5–7-nerved; flowers axillary, solitary; tube 2 cm. long, the lip 3 cm. long, 8 mm. wide at the lightly cordate base, narrowly oblong-lanceolate, acute, black-hirsute and glandular-punctate with yellow-bordered, black spots about the opening. Neg. 4903.

Río Acre: *Ule 9342*. Bolivia.

Aristolochia cauliflora Ule, Verh. Bot. Ver. Brandenb. 47: 120. 1905.

A thick-stemmed, high-climbing liana with cordate-acuminate, thick leaves; petioles about 15 cm. long; leaves blunt, with a broad, deep sinus, 13.5–22 cm. long, 11–20 cm. broad; flowers few, in fascicles, yellowish with lilac-red veins, to 10 cm. long; tube 2–2.5 cm. long; limb 1-lobed, lanceolate, sparsely pubescent within; lip 4–6 cm. long but only 2 cm. broad; capsule long-beaked, cylindric.—The tube throat is yellow at the edge, toward the mouth lilac or brown-purple, from the middle to the tip yellow, the tip itself flecked with dark purple and black-purple-papillate. Neg. 4904.

San Martín: Tarapoto, *Ule 6634* (type). Chazuta, 260 meters, *Klug 4125*.—Loreto: Almería, Middle Río Ucayali, *Tessmann 3516*.

Aristolochia deltoidea HBK. Nov. Gen. & Sp. 2: 146. *pl. 112*. 1817. *Howardia deltoidea* Klotzsch, Monatsb. Akad. Berlin 1859: 611. 1859.

Stems sulcate, puberulent above and at the nodes; leaves deltoid, 5-nerved, somewhat pubescent on the nerves beneath but not silvery, 6–9 cm. long and 5–6 cm. broad; pseudo-stipules orbicular-reniform, sessile; flowers axillary, small, greenish without, with brown veins, within yellowish, the tip of the lip pale green with dark brown veins; utricle ovoid, puberulent, 3 mm. long; tube to 10 cm. long, strongly infundibuliform, with one rounded lobe only 3 mm. long, the other 1.5 cm. long.

Cajamarca: Marañón Valley, *Humboldt 3645* (type). Tabaconas Valley in half-xerophytic shrub, 1,200 meters, *Weberbauer 6166*. Bellavista, in evergreen shrub, 500 meters, *Weberbauer 6210*. Jaén, *Raimondi*.—Amazonas: Bagua, *Raimondi*. Brazil.

Aristolochia didyma S. Moore, Journ. Bot. 53: 7. *pl. 535.* 1915.

Stems angled, glabrous; petioles 5–10 (–25) cm. long; leaves cordate-suborbicular, 5-nerved, glabrous, papyraceous, 10 cm. wide and 12 cm. long or sometimes twice as large; flowers 8–10 cm. long, purplish, red-lineate, axillary, solitary, the peduncles 6–10 cm. long; utricle 3–3.5 (–5) cm. long, the tube 2.5 cm. long, the limb nearly twice as long; lower lip densely long-ciliate within, the upper, erect lip 2-lobed, the ovate, obtuse segments glabrous without, ciliate within; capsule 3.5 cm. long, nearly 3 cm. thick.—Emits, as so many species, the odor of carrion. Flowers pale yellow, with purple stripes and margins (Ule).

Río Acre: *Ule 9338.* Brazil. "Zapato difunto."

Aristolochia elegans Mast. Gard. Chron. n. ser. 24: 301. *f. 64.* 1885.

Flowers solitary from the herbaceous shoots; petioles to 5.5 cm. long; blades ovate-reniform, openly but evidently cordate at the base, obtuse, glabrous, beneath glaucescent, to 8.5 cm. long and 9.5 cm. broad; flowers long-stalked, the slightly distended (2 cm. long) tube abruptly bent upward, cream-colored with many purplish brown markings within, the golden-yellow throat (6.3 cm. long) surrounded by a deep purple blotch, velvety in texture; limb obliquely cordate-ovate, 7.5–8 cm. long, 5 cm. wide; utricle 3.4 cm. long, 12 mm. thick, within at the base arachnoid-pubescent; gynostemium 6 mm. long, the anthers 4 mm. long.—Widely cultivated and naturalized in tropical lands.

Junín: In hedge at La Merced, 600 meters, *5322.* Santa Rosa, *Killip & Smith 28923.*

Aristolochia floribunda Lem. Ill. Hort. 15: *pl. 568.* 1868. *A. juruana* Ule, Verh. Bot. Ver. Brandenb. 7: 118. 1905.

Allied to *A. cauliflora,* but the thinner, cordate-reniform, acuminate leaves with a shallow sinus; flowers large, greenish yellow, the throat within dark carmine, with white veins, the tube mouth greenish yellow, the tube itself 1 cm. long, the throat 4 cm. long and nearly as wide; limb cordate-ovate, peltate; peduncles 4 cm. long, fasciculate-racemose, the flowers few or as many as 12. Neg. 4919.

Loreto: Mouth of Río Santiago, *Tessmann 4193.* Brazil.

Aristolochia fragrantissima Ruiz, Mem. Virt. Bejuco Estrella 46. 1805. *Howardia fragrantissima* Klotzsch, Monatsb. Akad. Berlin 1859: 615. 1859.

High climbing or procumbent and diffuse, the very long, sulcate-angled branchlets rusty-pubescent; leaves ovate-cordate, with a deep sinus, acuminate, above scabrous, beneath densely pubescent, to nearly 20 cm. long and half as broad, on petioles 2–5 cm. long; peduncles axillary, rarely geminate or ternate; calyx villous within; utricle to about 1.5 cm. long, the tube 2 cm. long, broad and little ampliate, the lip 3.5 cm. long; capsule oblong, obtusely hexagonous. —Leaves all only 5-nerved in 3 sheets comprising the type at Madrid, the 2 lateral basal nerves much fainter, so the leaves at base are prominently only 3-nerved. The measurements are from Ruiz's illustration, loc. cit. The illustration in Lambert, Cinchona 173, shows the tip of the lip with numerous small warts, placing the species (Schmidt) in the *Papillatae*. The flowers are said to be brown-red. Neg. 4914.

Huánuco: Posuso, *Ruiz*. "Bejuco de estrella," "contrayerba."

Aristolochia Guentheri O. C. Schmidt, Repert. Sp. Nov. 27: 292. 1930.

Stems, especially the older ones, erose; stipules none; petioles 3–4.5 cm. long; leaves 10–15 cm. long, 5.5–9 cm. wide, gradually acuminate, 5–7-nerved; flowers 4–5, glabrous, the peduncles 3–6 cm. long; utricle ellipsoid, 2 cm. long, 8 mm. thick, arachnoid within, the tube about 1.5 cm. long, the limb peltiform, spotted with deep purple, 2.5–3 cm. wide.—Allied with *A. Pilgeriana*. The flowers of the Peruvian specimen are larger, the limb about 4 cm. long and more than 3 cm. wide (Schmidt). Neg. 4917.

Junín: Chanchamayo Valley, 1,200 meters, *Schunke 392*. Bolivia.

Aristolochia iquitensis O. C. Schmidt, Notizbl. Bot. Gart. Berlin 10: 196. 1927.

Stipules none; leaves sublanceolate, 15–17 cm. long, 5.5–8 cm. wide, the sinus of the cordate base broad; bracts narrowly oblong-cordate, 1–1.5 mm. long; pedicels 2.5–3.5 cm. long; flower base obovoid, 7–9 mm. long, glabrous without, the obliquely truncate tip transitional to the erect, cylindric tube 7–8 mm. long, the upper lip of the dilated limb consisting of 2 lobes 1.2–1.6 cm. long and 6–8 mm. wide, these rounded and dilated at the apex; capsule narrowly elliptic, 7 cm. long; seeds narrowly oblong-cordate, 5 mm. long.—Similar to *A. lingulata* Ule, but the flowers different, these bright yellow and red-brown (Klug), basally green, purplish red above.

Loreto: Iquitos, *Tessmann 5120* (type). Mishuyacu, 100 meters, in forest, *Killip & Smith 29905; Klug 66, 1388.*

Aristolochia Killipiana O. C. Schmidt, Repert. Sp. Nov. 38: 111. 1935.

Stems slender, more or less sparsely pilose; petioles pilose, to 2.5 cm. long; leaf blades to 9.4 cm. long, 5 cm. wide, the sinus to 12 mm. deep and 15 mm. broad, thin, short-pubescent above, pilose beneath, especially on the 5–7 prominent nerves; flowers solitary, pilose, the utricle obovate-elliptic, the nearly erect tube apically dilated and almost bilabiately expanded, the subovate limb acuminate.—Allied to *A. triangularis* Cham., with glabrous, scarcely cordate leaves, the perianth lip not abruptly expanded. Only young flowers are known, for which the author gives the measurements: peduncle 3 cm. long; utricle 1 cm. long; tube 5 mm. long; lip 13 mm. long, 12 mm. broad.

Cuzco: Machupicchu, about 2,100 meters (*Cook & Gilbert 841*, type).

Aristolochia lingulata Ule, Verh. Bot. Ver. Brandenb. 47: 123. 1905.

Herbaceous, glabrous, with slender, round branchlets; leaves cordate-orbicular, acute, glaucous beneath, thick, 8–10 cm. long, 7.5–9 cm. broad, on petioles 5–6 cm. long; flowers solitary, axillary, 12–14 cm. long, the pedicel about as long, straw-colored with dark purple markings; tube base ventricose, the tube 2 cm. long; limb 2-lobed, the upper lobe lanceolate, acute, 4.5 cm. long, the lower 8–9 cm. long, lanceolate-lingulate, constricted toward the tip and there expanded; capsule elliptic, 8 cm. long. Neg. 4921.

San Martín: Tarapoto, *Ule 6581* (type). Chazuta, 260 meters, *Klug 3988.*—Loreto: Iquitos, *Tessmann 5157.* Santa Rosa, 135 meters, in forest, *Killip & Smith 28923.*

Aristolochia Macbrideana Standl., sp. nov.

Scandens herbacea, caulibus crassiusculis subteretibus pilis minutis brunnescentibus adpressis vel valde adscendentibus pilosulis; folia mediocria membranacea, petiolo gracili 3–3.5 cm. longo minute adpresso-pilosulo; lamina late triangulari-ovata 7–12.5 cm. longa 4.5–8 cm. lata acute acuminata, basi profunde (ad 2.5 cm.) cordata, sinu lato aperto, lobis basalibus late rotundatis, in sicco fusca, supra subsparse pilis brevissimis subadpressis brunnescentibus conspersa, subtus concolor, undique sed sparse minutissime adpresso-

pilosula, basi 5-nervia, nervis elevatis, venulis prominentibus laxe reticulatis; flores laxe racemosi, racemis paucifloris, rhachi plus minusve elongata, subsessiles, ovario clavato-lineari pilis minutis brevissimis patentibus vel subreflexis induto; utriculus obovoideus circa 1.8 cm. longus sordide minute adpresso-puberulus, abrupte in tubum 18 mm. longum medio 3 mm. crassum constrictus, labio (perfecto non viso) ut videtur ovato-oblongo apice obtuso vel rotundato extus minute adpresso-puberulo intus sparsissime villoso. —Flowers violet, green, and yellow.

San Martín: Chazuta, Río Huallaga, altitude 260 meters, April, 1935, *G. Klug 4079;* type in Herb. Field Mus.

Aristolochia maranonensis O. C. Schmidt, Repert. Sp. Nov. 23: 296. 1927.

Slender stems and petioles glabrous, the latter 3–7 cm. long; leaf blades glabrate above, densely arachnoid-pilose beneath and reticulate, 9.5–18 cm. long, 10–18 cm. wide, the sinus to 18 mm. deep; flowers 6 or fewer, greenish yellow, 8–10 cm. long; utricle obovoid, 3–3.5 cm. long, puberulent within and without as also the (1.5 cm. long) tube; limb broadly ovate, short-acuminate, 8.5–10.5 cm. long, with 2 brown-purple spots; gynostemium 5 mm. long, the lobes lanceolate, the anthers linear; capsule narrowly elliptic, 8 cm. long; seeds short-acuminate, 5 mm. long. Neg. 4922.

Loreto: Puerto Meléndez, *Tessmann 4865* (type).

Aristolochia Mathewsii Duchartre in DC. Prodr. 15, pt. 1: 497. 1864. *A. reticulata* Seem. Bot. Voy. Herald 193. 1852, not Nutt.

Branches pubescent; leaves oblong, cordate at the base, 3–5-nerved, obtuse or short-cuspidate, 5–12 cm. long, 2.5–3.5 cm. wide, glabrous above, pubescent and reticulate beneath; flowers solitary; perianth about 8 cm. long, the cordate limb villous without; capsule 3.5 cm. long.—By error Seemann's name has been written "*utriculata*" by Duchartre and later students. *A. Buchtienii* O. C. Schmidt, Repert. Sp. Nov. 27: 292. 1830, from northwestern Bolivia, has leaves 12–20 cm. long, 2–4 cm. wide, narrowed to the tip, densely short-pilose beneath, and flowers about 6.5 cm. long.

San Martín: Tarapoto (*Mathews*).

Aristolochia mishuyacensis O. C. Schmidt, Repert. Sp. Nov. 32: 96. 1933. *A. Williamsii* O. C. Schmidt, op. cit. 30: 70. 1932, not Rusby, 1910.

Stems slender, glabrous; petioles 5.5–7 cm. long; leaves broadly hastate, 12–18.5 cm. long, 8–10 cm. wide, usually acute, reniform-cordate at the base, the broadly rounded lobes 1.5–3 cm. long, glabrous, thin; stipules ovate, cordate at the base, acuminate, 25 mm. long, 18 mm. wide; flowers solitary, axillary, glabrous without, the peduncle with the ovary about 9 cm. long; utricle 5 cm. long, 2.2 cm. thick, glabrous within; upper (outer) part of the limb curved-cymbiform, the base truncate, to 5 cm. long, the apex subabruptly cordate, the appendage about 14 cm. long; ovary attenuate at the base; gynostemium 6.5 mm. long, the stipe 1.5 mm. long.—Flowers green and red-brown or greenish yellow, and dark violet (Klug).

Loreto: Fortaleza, Río Huallaga, 200 meters, *Williams 4314* (type). Mishuyacu, 100 meters, in forest, *Klug 1177, 1302.*

Aristolochia pandurata Jacq. Hort. Schoenbr. 4: 49. *pl. 497.* 1804; 475.

Stems sulcately angled; lower leaves mostly pandurate-hastate, the upper hastate, acuminate, the deeply cordate base with oblong-ovate, obtuse, divergent lobes, 7-nerved, 8–16 cm. long, 3.5–6 cm. wide; peduncles longer than the petioles, these 3–4.5 cm. long; flowers within lineate or reticulate with white or yellow; utricle 22 mm. long, the tube 10–15 mm. long, the limb 7 cm. long; capsule oblong, beaked, 7.5 cm. long.—Flowers yellow and whitish with black-purple markings (Ule).

Río Acre: *Ule 9339.* Bolivia to Central America and Venezuela.

Aristolochia peruviana O. C. Schmidt, Notizbl. Bot. Gart. Berlin 9: 136. 1924.

Stems below corky-ridged, to 1 cm. thick; petioles slender, tortuous, glabrous, 4–5 cm. long; leaves chartaceous, finely silvery-pubescent beneath, glabrous above, 5-nerved at the base, cordate-ovate, 8–17 cm. long, 6–11.5 cm. wide, the sinus rarely as much as 2 cm. deep; flowers glabrous, developing fasciculately from the lower stem, 6–10 together, the inflorescence to 6 cm. long; peduncles to 2.5 cm. long; limb peltate, 2.5–3.2 cm. long, 1.8–2.5 cm. broad, the tube slender, 7 mm. long, 4 mm. thick; utricle oblong-cylindric, rounded at the base, 12–15 cm. long, 4–7 mm. wide; perianth within deep red with black and white spots, the throat of the tube white, without spotted with pale lilac-red, the throat orange; gynostemium 5 mm. long, with 6 spreading lobes; anthers stipitate, 2 mm. long; ovary glabrous. Neg. 4925.

Loreto: Yarina-cocha, *Tessmann 3459,* type.

Aristolochia physodes Ule, Verh. Bot. Ver. Brandenb. 47: 119. 1905.

Similar to *A. deltoidea*, but the leaves often constricted medially and therefore subtrilobate, and somewhat silvery-glaucescent beneath; utricle 18 mm. long; tube strongly inequilateral, 6–7 mm. long; throat 3–3.5 cm. long, about 2 cm. broad; limb peltate, ovate, long-mucronate, the base bilobate-emarginate.—Ground color greenish white but the lip within reddish with dark purple marks and orange at the throat, the tube itself greenish white. Here would key *A. pseudotriangularis* O. C. Schmidt, Repert. Sp. Nov. 38: 110. 1935, with glabrous leaves. Neg. 4927.

San Martín: Tarapoto, *Ule 6582* (type).

Aristolochia Pilgeriana O. C. Schmidt, Repert. Sp. Nov. 23: 297. 1927.

Similar to *A. peruviana* but the leaves 7-nerved and with no marked sinus; leaf nerves beneath densely and finely pilose; utricle pink with purple nerves, purple-pubescent within, usually 2.5 cm. long, obovoid; tube to 14 mm. long, 5–6 mm. thick, glabrous; limb ovate-suborbicular, cordate at the base, obtuse, mucronate, to 3.5 cm. long; gynostemium obconic, to nearly 4 mm. long, the linear anthers 1.8 mm. long; ovary glabrous.—By slip of the pen *A. Pilgeri* O. C. Schmidt, op. cit. 27: 293. 1930. Neg. 4926.

Loreto: Mouth of Río Santiago, *Tessmann 4374* (type).

Aristolochia pilosa HBK. Nov. Gen. & Sp. 2: 146. *pl. 113.* 1817; 454.

Stems slender, spreading-hirsute with brown hairs; petioles 2.5 cm. long; leaf blades ovate, cordate or subhastate-cordate, the deep sinus with nearly parallel, rounded lobes, glabrous above, 7 cm. long, 4–4.5 cm. wide at the base; peduncles 1.5 cm. long; flowers sparsely pilose; utricle 22 mm. long, the tube 3 cm. long, the lip 18 mm. long.

Peru: (Surely). Bolivia to Central America.

Aristolochia putumayensis O. C. Schmidt, Repert. Sp. Nov. 38: 112. 1935.

Slender-stemmed and glabrous except the leaves beneath and the flowers within; petioles to 5 cm. long; leaves oblong-ovate or deltoid-ovate, to 14.5 cm. long, truncate, angulately rounded, short-acuminate, chartaceous, shortly grayish-silvery-pilose beneath; flowers few,

reddish brown and orange, the peduncles about 6 cm. long; utricle narrowly obovoid, arachnoid within, to nearly 3 cm. long and 2 cm. wide, the suberect tube to over 4 cm. long, its oblique limb over 2 cm. long; ovary pilose; capsule narrowly elliptic, about 6.5 cm. long, very thin.—Related to *A. Pilgeriana*, according to the author. *A. Klugii* O.C. Schmidt, op. cit. 30: 66, is smaller, the tube only 3 cm. long but the limb to 7 cm. long and flaring, as in *A. iquitensis*.

Loreto: Florida, Río Putumayo, 200 meters (*Klug 2032*).

Aristolochia Rimbachii O. C. Schmidt, Repert. Sp. Nov. 23: 287. 1927.

Stems slender; petioles 3.5–4.5 cm. long; leaves narrowly cordate, the sinus nearly 2 cm. deep, 4 cm. wide, short-cuspidate, chartaceous, 5(–7)-nerved, more or less densely but very shortly pilose beneath; flowers whitish without, glabrescent; utricle obovoid, 10–12 mm. long; tube about 12 mm. long, 2 mm. thick, the opening yellow; limb narrowly peltiform, 5–7.5 cm. long, 3 cm. broad, glabrous, reddish brown with pale reddish nerves; capsule oblong-ovoid, acuminate, 6 cm. long, 2.5 cm. thick.—Near *A. odoratissima* L., widely distributed in South America, and to be expected; its utricle is about twice as long, the flowers violet and purple, like those of *A. pandurata*, the capsule 12 mm. thick.

Peru: (Probably). Ecuador; Bolivia.

Aristolochia Ruiziana Duchartre in DC. Prodr. 15, pt. 1: 476. 1864. *A. Duchartrei* André, Le Mouvem. Hortic. 61. 1867; Fl. Serres 18: 35. 1869.

Stem smooth and lustrous; petioles stout, to 12 cm. long; leaf blades coriaceous, green and lustrous above, very glaucous, shortly crisped-puberulent, and conspicuously reticulate-veined beneath, 15 cm. long or longer and nearly as wide, short-acuminate, the base angled-truncate, scarcely cordate; flowers large, the connate limb 12 cm. long or longer, the obovoid utricle 7.5 cm. long and 3 cm. thick, the tube 3.5 cm. long, the throat 12–18 cm. long.—The measurements (as in other descriptions usually) are by Schmidt, in this instance from Colombian material, the type being imperfect. The flowers without are yellowish with brown veinlets, the throat within thickly flecked with black-purple on a whitish ground, the mouth of the tube white. Klotzsch assigned the name in herbarium under *Howardia*. Illustrated, Fl. Serres 18: 35. Neg. 4930.

Huánuco: Chicoplaya, *Ruiz & Pavón*. Colombia.

Aristolochia truncata Field. & Gardn. Sert. Pl. 1: *pl. 44.* 1844. *Howardia truncata* Klotzsch, Monatsb. Akad. Berlin 1859: 610. 1859. *A. tarapotina* Ule, Verh. Bot. Ver. Brandenb. 47: 123. 1905.

Closely allied to *A. amazonica,* but the leaves often 10–14 cm. long and 7–8 cm. wide; flowers yellowish green, the oval-ovate lip purple-splotched within and sparsely papillose with fleshy processes. Negs. 4937, 27818.

San Martín: Tarapoto, 750 meters, *Ule 6501; Williams 5454, 5560, 5570.* Brazil. "Oreja de perro."

Aristolochia Weberbaueri O. C. Schmidt, Repert. Sp. Nov. 23: 294. 1927.

A vine with somewhat angled branches; petioles 1.5–4 cm. long; leaf blades deltoid-cordate, 4.5–10.5 cm. long, 3–6 cm. broad, the sinus 8–12 mm. deep, 7-nerved, glabrescent above, pilose on the nerves beneath; stipules ovate, 6–12 mm. long; flowers axillary, solitary, glabrous without, 4.5 to nearly 6 cm. long, reddish brown; utricle broadly ovate, 12–18 mm. long, sparsely arachnoid within; tube 1.5–2.5 cm. long; limb lanceolate, 2.5–3.5 cm. long, about 1.5 cm. wide, mucronate, lightly pilose at the base; gynostemium 5.5 mm. long, the narrowly linear anthers 3 mm. long; ovary puberulent.—Distinguished by the author from *A. fragrantissima* by the absence of papillae on the lip (but cf. descr.).

Huancavelica: In grasslands above Colcabamba, 2,200 meters, *Weberbauer 6444* (type).

57. RAFFLESIACEAE. Rafflesia Family

Reference: Harms: Pflanzenfam. ed. 2. 16b: 243–281. 1935.

Among the most singular plants in the world, these parasites, practically without vegetative development other than the flower which is produced directly from the roots or stems of the host plant, are represented in Peru only by a small-flowered plant on the branches of *Casearia,* or of other shrubs, possibly. It is surprising to learn that these tiny flowers, like elongate knobs projecting horizontally from branches of the host, are closely related to the strangely formed and colored Rafflesias that may measure 1 meter across (see Pflanzenfam. 262 for a photograph of one).

Besides the following genus, the scarcely distinct *Pilostyles* Guill. may be expected, especially on Leguminosae inhabiting the grass steppes. It is separated by having the perianth lobes broadened at the base and the placentae indefinitely or poorly developed.

1. **APODANTHES** Poit.

Little plants that practically are only small flowers borne directly and divaricately on the trunks and branches of *Casearia*. Perianth divisions free, narrowed at the base, subtended by 2 opposite, tiny, scale-like leaves. Placentae 4, broad.

Apodanthes Casearíae Poit. Ann. Sci. Nat. 3: 422. *pl. 26*. 1824.

Flowers about 5 mm. long, waxy white or reddish, often many close together.—Curiously enough, only the pistillate plants have ever been observed. Illustrated, Mart. Fl. Bras. 4, pt. 2: *pl. 27*.

Loreto: Sierra de Ponasa, *Ule 6937b*. Guianas and Brazil.

58. **POLYGONACEAE.** Buckwheat Family

By Paul C. Standley

Reference: Meisner in DC. Prodr. 14: 1–186. 1857.

Herbs, shrubs, or trees, sometimes scandent; leaves mostly alternate and penninerved, entire or essentially so; stipules represented by tubular, membranaceous to coriaceous structures (ocreae), these persistent or deciduous, sometimes wanting; flowers usually small, sometimes large and showy, perfect or unisexual, most often racemose, the racemes simple or paniculate, the flowers clustered in distinct nodules; bractlets, if present, more or less connate to form ocreolae; pedicels articulate; perianth segments 5–6, free or connate, equal or unequal, often accrescent in fruit; stamens 5–10, the filaments free or connate at the base, the anthers longitudinally dehiscent; ovary free, 1-celled, 1-ovulate; styles 1–3, free or partially connate; fruit a lenticular or 3–4-angulate achene, usually enclosed in the perianth.

Plants with tendrils, these terminating the inflorescence. 1. *Antigonon.*

Plants without tendrils.

Plants herbaceous or merely suffrutescent.

Perianth segments 6, in 2 series, the inner ones accrescent in fruit and enveloping the achene, sometimes with granules on the outer surface ..... 2. *Rumex.*

Perianth segments 3–5, equal or nearly so, never with granules.

Flowers perfect; perianth not fleshy ..... 3. *Polygonum.*

Flowers dioecious or polygamo-dioecious; perianth fleshy in fruit ..... 4. *Muehlenbeckia.*

Plants woody, trees or shrubs, rarely scandent.

Flowers perfect; perianth segments 5.....5. *Coccoloba.*

Flowers dioecious; perianth segments 6.

Inner perianth segments enlarged in fruit, not red; stamens numerous.....6. *Symmeria.*

Outer perianth segments enlarged in fruit, red; stamens 9.

Achenes obtusely trigonous.....7. *Ruprechtia.*

Achenes very acutely trigonous.....8. *Triplaris.*

1. ANTIGONON Endl.

Plants scandent, herbaceous or suffrutescent, the branches angulate; leaves petiolate, cordate, entire or nearly so; ocreae opposite the leaves, obsolete and scale-like; flowers racemose, opposite the leaves, solitary, simple, terminating in a tendril, the flowers fasciculate in the raceme; sepals 5, colored, unequal, the 3 outer ones cordate, the 2 inner ones narrower; stamens 8, equal; achene included in the calyx, 3-angulate.—The genus is easy of recognition because of the tendril-bearing racemes.

Antigonon leptopus Hook. & Arn. Bot. Beechey Voy. 308. *pl. 69.* 1839–40.

A large vine, somewhat pubescent; leaves deltoid or broadly ovate, deeply cordate at the base, acute to obtuse; flowers at first small and inconspicuous but enlarging and finally 1 cm. long or more, bright rose-pink.

Loreto: Iquitos, *Williams 3549, 1529, 1354.* Yurimaguas, *Williams 4046.* Caballo-cocha, *Williams 2286.* La Victoria, *Williams 2818.*—San Martín: Tarapoto, *Williams 5949.* Native of Mexico and Central America, cultivated commonly for ornament in South America, as in most tropical regions, and often becoming naturalized. "Lazo de amor," "amor enredado."

A very handsome vine because of its great abundance of large, handsomely colored flowers, which persist for a long time, and are as showy in fruit as during anthesis.

2. RUMEX L.

By K. H. Rechinger f.

Reference: K. H. Rechinger f., Die süd- und zentralamerikanischen Arten der Gattung *Rumex,* Ark. Bot. 26A, No. 3. 1933.

Flowers dioecious, polygamous, or androgynous; perianth 6-parted, herbaceous, the 3 inner segments often larger, enlarging

after flowering and enclosing the nutlet, sometimes developing a grain on the midrib near the base; anthers 6, inserted in pairs on the base of the 3 outer perianth lobes; stigmas 3, penicillate; achenes 3-angled.

Flowers dioecious or polygamous; leaves hastate; valves (inner perianth segments) not enlarged in fruit..... *R. Acetosella.*

Flowers usually androgynous; leaves not hastate; valves enlarged in fruit.

Valves entire.

Valves without grains; plants very tall..... *R. peruanus.*

Valves with grains; plants of medium size.

Leaves short, obovate, thick; plants ascending, low. *R. cuneifolius.*

Leaves oblong or lanceolate, thin; plants erect, of medium size.

Lower leaves cordate at the base; flower verticels remote, nearly all with a leaf; pedicels not longer than the fruit. *R. conglomeratus.*

Leaves narrowed at both ends; flower verticels not or not all remote, only the lowest sometimes with a leaf; pedicels about twice as long as the fruit.... *R. crispus.*

Valves toothed.

Lower leaves large, deeply cordate at the base, thin; pedicels about 2.5 times longer than the fruit, jointed near the base. *R. obtusifolius.*

Lower leaves small, slightly cordate at the base, thickish; pedicels as long as the fruit, jointed at the middle. *R. pulcher.*

Rumex Acetosella L. Sp. Pl. 338. 1753; 47.

A low, slender perennial with linear or lanceolate, hastate leaves; valves entire, not enlarged in fruit, not larger than the nutlet, grainless.—A weed of European origin, naturalized nearly throughout the world. The subspecies *angiocarpus* Murbeck, Beitr. Fl. Südbosn. 46. 1891, is remarkable in the union of the valves and the nutlets into a single body; it is known from Chile, Prov. Cautín, *Werdermann 1254,* and from Falkland Islands, Port Stanley, *Birger.* Illustrated, Reichenb. Icon. Fl. Germ. 24: *pl. 192.*

Junín: La Quinua, 3,600 meters, clay bank along trail, *2010.* Colombia; Brazil; Argentina; Chile.

Rumex conglomeratus Murr. Prodr. Fl. Götting. 52. 1770; 45.

Lower leaves cordate at the base, plane; branches of the panicle divergent; flower verticels nearly all with a leaf, remote; pedicels usually not longer than the fruit; valves small, about 2.5 mm. long, entire, all bearing large grains.—A weed of European origin, naturalized in extratropic parts of the New World, but not so common as *R. crispus*. Illustrated, Reichenb. Icon. Fl. Germ. 24: *pl. 166*.

Huánuco: Mito, abandoned river pasture, 2,700 meters, *1557*. Huánuco, 2,100 meters, ditch banks, *3508*.—Junín: Tarma, 3,100 meters, shaded stream banks, *Killip & Smith 21864*.—Lima: Amancaes, *Savatier 1602*. San Lorenzo Island, *Andersson*. Venezuela; Bolivia; Uruguay; Argentina; Chile. "Acelga."

Rumex crispus L. Sp. Pl. 335. 1753; 44.

Stem strict, erect; leaves narrowed at both ends, lanceolate, acute, crisped; panicle elongate, narrow; pedicels longer than the fruit; valves round-ovate, somewhat cordate at the base, entire, 4–5 mm. long, usually all grain-bearing, but the grains of the same perianth often unlike in size or even 2 of them absent.—A common weed of European origin, introduced to most other parts of the world and naturalized in extratropical regions. A polymorphic species.

Lima: Lima, *W. Nation*.—San Martín: San Roque, 1,400 meters, *Williams 7777*.—Huánuco: Mito, weed in pasture, 2,700 meters, *1683*. Bolivia; Argentina; Chile.

Rumex cuneifolius Campd. Mon. Rum. 95. 1819; 20.

Widely creeping, with somewhat fleshy, obovate leaves and small fruiting panicles; leaves somewhat crisped marginally, the rather short petioles and leaf nerves beneath scabrous; branches of the panicle few, short; flower verticels usually approximate, without leaves; pedicels thick, shorter than the fruit, usually jointed at the middle; valves firm, triangular-ovate, entire, 4–5 mm. long, all with a prominent grain; ripe achenes dark brown, broadest at the middle, 2.5 mm. long.—This species of peculiar habit can not be confused with any other Peruvian one. It is widely spread through a large part of southern South America and introduced to some ports of North America and Europe. The height of stem, thickness of leaves, and size of valves are variable. A hybrid, *R. mirabilis* Rech. f. (*R. crispus* × *cuneifolius*) op. cit. 48, is known from Bolivia: La Paz, *Buchtien 4488*. Illustrated, Rech. f. op. cit. *pl. 5*.

Arequipa: Arequipa, *Holway 766*. Viktortal, "La Chorunga," 1,050 meters, *Weberbauer 1447*.—Cuzco: San Cristóbal, 3,450 meters,

Herrera 2175. Below Cuzco, *Rose.*—Puno: Lake Titicaca, *Lechler.*—Junín: Oroya, 3,600 meters, margin of brook, *985.*—Tacna: Alto de Tacora, *Isern 2032.* Bolivia; Uruguay; Argentina; Chile. "Llague."

Rumex obtusifolius L. Sp. Pl. 335. 1753; 46.

Lower leaves broad, deeply cordate at the base, flat, the upper rounded at the base, narrower, lanceolate; branches of the panicle divergent; only the lower flower verticels with leaves and remote; pedicels slender, to 2.5 times as long as the fruit, jointed near the base; valves 5–6 mm. long, usually one of them bearing a grain, with 2 or 3 often very pronounced teeth on each side.—A weed of European origin, very polymorphic in Europe, introduced to South America only as subsp. *agrestis* (Fries) Danser, Nederl. Kruidk. Arch. 1925: 424. 1926 (*R. obtusifolius β agrestis* Fries, Novit. Fl. Suec. ed. 2. 99. 1828), to which the following specimens belong. For a discussion of this variable species see Rechinger f., Vorarbeiten zu einer Monographie der Gattung *Rumex* I, Beih. Bot. Centralbl. 49, Abt. 2: 41. 1932. Illustrated, Reichenb. Icon. Fl. Germ. 24: *pl. 181.*

Cuzco: Cuzco, *Herrera.* Colinas de Sacsahuamán, 3,450 meters, *Herrera 2347.*—Huánuco: Mito, 2,700 meters, river shore, *1708.*—Lima: Río Blanco, 3,600 meters, grassy river bank, *820.* Brazil; Argentina. "Paico."

Rumex peruanus Rech. f. Ark. Bot. 26A, No. 3: 6. 1933.

Plant completely smooth, vigorous, the simple, strict, trunk-like stem to 2 meters tall or taller, the internodes elongate, with short, caducous ocreae; leaves rigid but thin (dried), the radical rounded or truncate at the base, elongate-elliptic, plane, broadest at the middle, about 2.5 times as long as wide; lateral nerves numerous, forming an angle of 60–70° with the midrib; petioles of basal leaves one-third to one-fourth shorter than the blade, with very large, pale brown basal ocreae; pedicels thin, 2.5–4 times as long as the fruit, obscurely jointed near the base; valves truncate at the base, roundish, entire, finely reticulate, the midnerve somewhat thicker but never grain-bearing; achene 2.5–3 mm. long, dark brown when ripe, narrowed at both ends.—This species was first described from an incomplete specimen in the Berlin Herbarium, consisting of three basal leaves, a fragment of stem, and some ripe fruits. The upper leaves, inflorescence, and flowers are thus unknown. In the form, consistency, and nervation of the basal leaves and the grain-bearing valves it is similar to *R. tolimensis* Wedd. Ann. Sci. Nat. III. 13: 262. 1849, from Colombia, which differs especially by

its short internodes, stouter stems, and leaves covered by a dense, yellowish or brownish pubescence beneath. Illustrated, Rechinger f. op. cit. *f. 1.*

Peru: Without locality, *Weberbauer 5473* (type).—Ancash: Pomopampa, 4,200 meters, in patches in bog holes of dryish flats, *2492.* —Cuzco: Valle de Paucartambo, Hacienda Churu, *Herrera 2313.*

Rumex pulcher L. Sp. Pl. 336. 1753; 46.

Lower leaves small, somewhat crisped marginally, cordate at the base, often pubescent; branches of the panicle very divergent, often intricate in fruit; flower verticels partly with leaves, all remote; pedicels thick, not longer than the fruit, jointed at the middle; valves toothed, 4.5–6 mm. long, 2.5–4.5 mm. wide, usually all bearing a grain, but the grains often unequal in size; achenes 3–4 mm. long, broadest a little below the middle.—A weed originally from the Mediterranean Basin, naturalized in regions of the New World climatically suitable. A variable species, especially as regards shape of the valves; the subsp. *eu-pulcher* Rech. f. Vorbarbeiten Monogr. *Rumex* I, Beih. Bot. Centralbl. 49, Abt. 2: 25. 1932, with usually fiddle-shaped and relatively narrow but long, toothed valves, and the subsp. *divaricatus* (L.) Murb. Beitr. Fl. Südbosn. 45. 1891 (*R. divaricatus* L. Sp. Pl. ed. 2. 478. 1762), with leaves nearly ovate and relatively broad but short, toothed valves, are known from South America and almost surely will be found in Peru. Illustrated, Reichenb. Icon. Fl. Germ. 24: *pl. 183.*

Peru: Probably. Brazil; Uruguay; Argentina; Chile.

3. POLYGONUM L.

Plants herbaceous, erect or prostrate, sometimes scandent; ocreae membranaceous or with a green, herbaceous border, sometimes scarious; flowers small, perfect, green or colored, axillary and solitary or aggregate or in racemes or spikes, the pedicels articulate; calyx normally 5-parted, the lobes subequal, often gland-dotted; stamens usually 8, the filaments subulate; achene included in the calyx, lenticular or 4-angulate.

Flowers axillary, solitary or fasciculate.

Ocreae very large and conspicuous, deeply lacerate; upper leaves linear.....*P. lacerum.*

Ocreae small, inconspicuous, not deeply lacerate; upper leaves oblong.....*P. aviculare.*

Flowers in long-pedunculate racemes or spikes.

Leaf blades shallowly cordate at the base.....*P. Meisnerianum.*

Leaf blades acute to long-attenuate at the base.

Stems hirsute or hispid.

Ocreae with a large, green, spreading, herbaceous border. *P. hispidum.*

Ocreae membranaceous throughout, not green. *P. peruvianum.*

Stems glabrous.

Ocreae glabrous throughout, not with marginal bristles. *P. portoricense.*

Ocreae often strigose, with long marginal bristles.

Perianth with numerous small, dark glands..*P. punctatum.*

Perianth not gland-dotted.....*P. hydropiperoides.*

Polygonum aviculare L. Sp. Pl. 362. 1753.

Plants glabrous, annual, prostrate and much branched, often forming dense mats; leaves short-petiolate, oblong or narrowly oblong, mostly 2–3 cm. long, obtuse or acutish, pale green; flowers green or whitish, sometimes tinged with pink.

Lima: Matucana, 2,400 meters, steep, rocky slope, *91*. Native of the Old World, naturalized almost throughout the cooler regions of America.

The single Peruvian collection is referable here at least in the broad concept of the species. It seems better referable to *P. aviculare* than to any of the several South American species that are closely related but presumed to be indigenous.

Polygonum hispidum HBK. Nov. Gen. & Sp. 2: 178. 1817.

A large, coarse perennial, often a meter high, with stout, hispid stems; ocreae 1–3 cm. long, densely hispid, with large, spreading, green borders; leaves long-petiolate, lanceolate to narrowly ovate, 8–20 cm. long, long-acuminate, sparsely or densely hispid; racemes thick and dense, often paniculate, 2–10 cm. long or larger, the flowers pink or deep red; achene lenticular, 4 mm. long, black and shining.

Reported from Peru (Meisn. in DC. Prodr. 14: 122) upon the basis of a Ruiz collection, the locality not known. To be expected in the eastern lowlands. Widely distributed in South America, ranging northward to Guatemala; growing usually in swampy places.

Polygonum hydropiperoides Michx. Fl. Bor. Amer. 1: 239. 1803.

Plants erect or ascending, annual or perennial, the slender stems glabrous, less than a meter high; ocreae 1–3 cm. long, appressed, strigose, with long bristles on the margin; leaves almost sessile, lanceolate or linear-lanceolate, 5–15 cm. long, long-attenuate, strigose at least on the margins and costa; racemes erect, dense, 10 cm. long or less, the flowers usually deep pink; achene more or less trigonous, sometimes almost lenticular.—Illustrated, Mem. Dept. Bot. Columb. Coll. 1: *pl. 27.*

Cajamarca: Celendín, 2,625 meters, *Woytkowski 10*; a common weed, filling ditches and marshy spots on plain.—Cuzco: Valle del Paucartambo, 3,000 meters, *Herrera 3361*; at 3,400 meters, Hacienda Churu, *Herrera 2330.*—Huánuco: Mito, 2,700 meters, between rocks along river, *1545.*—Lima: Chosica, 900 meters, edge of ditch, *2861.* Widely distributed in the cooler regions of America, also in the tropics.

Polygonum lacerum HBK. Nov. Gen. & Sp. 2: 179. 1817.

Plants apparently erect and perennial, inclined to be suffrutescent at the base, glabrous, pale, the stems branched, striate; ocreae often equaling the upper internodes, very conspicuous, whitish, scarious; upper leaves linear, fleshy-coriaceous, the lower ones linear-oblong, obtuse or acutish, short-petiolate, mostly 2–3 cm. long; flowers axillary, inconspicuous. Neg. 4977.

Cajamarca: Type collected at hot springs near Cajamarca, *Humboldt.*—Bolivia and Argentina.

Polygonum Meisnerianum Cham. & Schlecht. Linnaea 3: 40. 1828.

Plants very slender, perennial, subscandent, the stems sparsely glandular-hispidulous and with larger, recurved, prickle-like hairs at the nodes; leaves sessile or nearly so, linear or lance-linear, 5–15 cm. long, 5–15 mm. wide, attenuate, aculeolate beneath along the costa, elsewhere glabrous or nearly so; ocreae naked at the margin; inflorescences dichotomous, the racemes few, few-flowered, the peduncles glandular; perianth pink; achenes 3-angulate, lustrous.

San Martín: Zepelacio, near Moyobamba, 1,200–1,600 meters, *Klug 3580;* flowers cream-colored. Argentina to Mexico and southeastern United States.

Polygonum peruvianum Meisn. in DC. Prodr. 14: 122. 1857.

Plants erect, slender, the stems glandular-hispid below the nodes, finally glabrate; ocreae 2.5 cm. long, strigose; leaves oblong-lanceo-

late, acuminate, subsessile, appressed-pilose, 7–10 cm. long, acute to rounded at the base; racemes geminate, oblong, 2.5–3.5 cm. long, the flowers large; achene lenticular.

Type collected at some unspecified locality in Peru, *Mathews 3120*.—Amazonas: Chachapoyas, *Weberbauer 4436* (fide Macbride).

Polygonum portoricense Bert. ex Small, Mem. Bot. Columb. Coll. 1: 46. 1895. *P. glabrum* Cham. & Schlecht. Linnaea 3: 46. 1828, non Willd. 1799.

A stout, glabrous perennial, sometimes 1.5 meters high; ocreae very large, often as long as the nodes; leaves slender-petiolate, the blades lanceolate, 15–30 cm. long, long-acuminate, with conspicuous lateral nerves; racemes slender, 5–13 cm. long, dense, erect, the flowers white or pink; achenes lenticular or 3-angulate, black and shining.

Loreto: Pebas, *Williams 1994*. Iquitos, 120 meters, *Williams 8086*. Caballo-cocha, aquatic, *Williams 2455*. Río Masana, *Williams 3*. Extending to Argentina, the West Indies, and southern United States. "Tabaco de lagarto."

Polygonum punctatum Ell. Bot. S. C. & Ga. 1: 455. 1817. *P. acre* HBK. Nov. Gen. & Sp. 2: 179. 1817, non Lam. 1778.

Plants slender, annual or perennial, glabrous or nearly so, erect or ascending, usually less than 1 meter high; ocreae appressed, fringed with long bristles; leaves short-petiolate, linear-lanceolate, mostly 5–10 cm. long, acuminate; racemes very slender, 2–8 cm. long, the nodes remote, the flowers greenish white; achene lenticular or 3-angulate, black and lustrous.—Illustrated, Mem. Bot. Columb. Coll. 1: *pl. 31*.

Junín: Puerto Bermúdez, 375 meters, in thickets, *Killip & Smith 26682*.—Loreto: Yurimaguas, 200 meters, edge of small stream, *Williams 3842*. Mishuyacu, 100 meters, in clearing, *Klug 338*. Iquitos, 120 meters, *Williams 1410, 7984*.—San Martín: San Roque, in pasture, 1,400 meters, *Williams 7691*. Tarapoto, *Williams 5657*. Widely distributed in tropical America, often a common weed, extending northward to the United States. "Yacu shutiri."

4. MUEHLENBECKIA Meisn.

Shrubs or suffrutescent plants, the stems usually scandent or prostrate, angulate or sulcate, the ocreae membranaceous, obliquely truncate, cylindric, usually soon deciduous; leaves petiolate, often cordate or sagittate; flowers small and inconspicuous, dioecious or

polygamo-dioecious, whitish or greenish, solitary or fasciculate in the leaf axils or racemose or paniculate, the pedicels articulate; calyx herbaceous, 5-parted, the lobes subequal or the 2 inner ones smaller, in fruit more or less accrescent, sometimes thick and succulent; stamens 8 in the staminate flower, about equaling the sepals; styles 3 and short or none; achene 3-angled, enclosed in the fleshy perianth or more or less exserted.—The oldest name for the genus is *Calacinum Raf.*, and the name *Muehlenbeckia* is not conserved. Since the latter has been in general use for the group, it seems preferable to continue its use, in the confident expectation that it will be conserved.

Flowers in sessile glomerules; leaves mostly acute or attenuate at the base, never cordate or hastate-lobate.

Plants usually prostrate and matted; leaves small, mostly less than 15 mm. long and acute or acutish, sometimes obtuse or rounded.....*M. volcanica.*

Plants erect or scandent; leaves mostly larger and 2 cm. long or more, but sometimes small, broadly rounded to very obtuse at the apex.

Plants erect; leaf blades mostly conspicuously longer than broad. *M. fruticulosa.*

Plants scandent; leaf blades mostly as broad as long. *M. Nummularia.*

Flowers in simple or paniculate racemes; leaves cordate at the base or more or less evidently hastate-lobate.

Leaves not cordate at the base, more or less hastate-lobate; racemes simple, often greatly reduced.....*M. hastulata.*

Leaves cordate at the base; racemes simple or paniculate.

Racemes simple; leaves often puberulent beneath..*M. peruviana.*

Racemes paniculate; leaves glabrous or puberulent beneath.

Leaves densely puberulent or tomentulose beneath; achenes often semi-exserted.....*M. tiliifolia.*

Leaves glabrous; achenes covered by the sepals..*M. tamnifolia.*

Muehlenbeckia fruticulosa (Walp.) Standl., comb. nov. *Polygonum fruticulosum* Walp. Nov. Act. Acad. Leop. 19: Suppl. 1: 407. 1843. *M. rupestris* Wedd. Ann. Sci. Nat. III. 13: 256. 1850. *Sarcogonum fruticulosum* Rusby, Mem. Torrey Club 4: 251. 1895. *Calacinum fruticulosum* Macbr. Field Mus. Bot. 4: 115. 1927.

A glabrous, rather densely branched, erect shrub about a meter high; ocreae small, often rather long-persistent; leaves petiolate, the blades thick and fleshy or coriaceous, elliptic-oblong to broadly oval, the larger ones 1.5–2.5 cm. long, rounded or very obtuse at the apex, cuneately narrowed at the base; flowers short-pedicellate, few or numerous at each node; achene included in the perianth. Neg. 4981 (*M. rupestris*).

Arequipa: Yura near Arequipa, 2,600 meters, *Weberbauer 6840.* —Moquehua: Carumas, 3,100 meters, *Weberbauer 7483.*—Puno: Puno, 4,000 meters, *Soukup 372.* Lake Titicaca, *Meyen.*—Sandía(?): Pascomayo to Moyobamba (*Stuebel 37a*). Bolivia.

It is doubtful whether this is more than an ecological form of *M. volcanica,* and it should probably be reduced to varietal rank under that species.

Muehlenbeckia hastulata (Smith) Standl., comb. nov. *Rumex hastulata* Smith in Rees, Cycl. 29. 1802–20. *M. chilensis* Meisn. in DC. Prodr. 14: 148. 1856. *M. chilensis* var. *fascicularis* Meisn. loc. cit. *Sarcogonum chilense* Rusby, Bull. Torrey Club 27: 128. 1900. *Calacinum chilense* and *C. hastulatum* Macbr. Field Mus. Bot. 4: 116. 1927.

Plants woody, scandent, pale green when dried, glabrous; ocreae large and brown, conspicuous, rather long-persistent; leaves fleshy-coriaceous, rather long-petiolate, the blades broadly hastate-ovate to linear-hastate, truncate to attenuate at the base, obtuse to acuminate; flowers short-pedicellate, in axillary and terminal, short or somewhat elongate racemes, the pedicels short; achene included in the perianth or somewhat exserted. Negs. 7431, 27770.

Arequipa: Above Arequipa, open, rocky slopes, 2,800 meters, *Pennell 13246.* Near Arequipa, *Lechler 2746.*—Cuzco: Pachar, bushy bank, 2,900 meters, *Pennell 13691.* Urubamba, *Weberbauer 4914.* —Junín: Yanahuanca, 3,000 meters, *1221.* Bolivia and Chile. "Huano negro."

The plant is extremely variable in leaf form, and some of the forms are perhaps worthy of varietal rank.

Muehlenbeckia Nummularia H. Gross, Bot. Jahrb. 49: 346. 1913.

A much branched, scandent, glabrous shrub; ocreae rather long-persistent; leaves petiolate, the blades coriaceous, broadly oval to orbicular, 8–20 mm. long, 8–17 mm. wide, broadly rounded and

sometimes apiculate at the apex, abruptly decurrent into the petiole; flowers densely fasciculate in the leaf axils; achene enclosed in the perianth.

Ancash: Below Hacienda Cajabamba, between Samanco and Caraz, 3,000–3,500 meters, *Weberbauer 3172.*

This is probably only a form or variety of *M. fruticulosa* or *M. volcanica.* There is known only the type collection, of which I have seen fragmentary material.

Muehlenbeckia peruviana Meisn. in DC. Prodr. 14: 150. 1856. *Calacinum peruvianum* Macbr. Field Mus. Bot. 4: 117. 1927.

A scandent shrub, the branches glabrous or somewhat tomentulose; ocreae conspicuous and long-persistent; leaves slender-petiolate, the blades subcoriaceous, ovate or oval-oblong, mostly 3.5–5 cm. long, obtuse or subacute, puberulent beneath or almost glabrous, shallowly cordate at the base; racemes short and dense, usually shorter than the leaves, sometimes greatly reduced; achenes more or less exserted. Neg. 4980.

Junín: Huasa-huasi, *Dombey 210* (type); *Ruiz & Pavón.*—Cuzco: Paso de Tres Cruces, 3,500–3,800 meters, in thickets, *Pennell 13894.* Yanamanche, 3,500 meters (*Weberbauer 4951*).

Muehlenbeckia peruviana var. **cuspidata** Standl., var. nov. *M. cuspidata* H. Gross in herb.

A forma typica foliis solemniter acuminatis vel longiacuminatis differt.—Apparently differentiated from the typical form only by the conspicuously acuminate leaves.

Ancash: Pichín, *Weberbauer 2929* (type, a fragment of this number in Herb. Field Mus., received from Herb. Berlin).—Huánuco: Monzón, *Weberbauer 3373.*—Without locality: *Ruiz & Pavón 13–95.* Also in Ecuador (Loja–Zamora, *André 4521*).

Muehlenbeckia tamnifolia (HBK.) Meisn. Comm. 2: 227. 1840. *Polygonum tamnifolium* HBK. Nov. Gen. & Sp. 2: 180. 1817. *M. tamnifolia* var. *laxiflora* Meisn. in DC. Prodr. 14: 149. 1856. *M. leptobotrys* Meisn. loc. cit. *Sarcogonum tamnifolium* Rusby, Mem. Torrey Club 6: 111. 1896. *Calacinum tamnifolium* and *C. leptobotrys* Macbr. Field Mus. Bot. 4: 116. 1927.

A large, scandent shrub, glabrous throughout or nearly so; ocreae large, scarious, deciduous; leaves on short or elongate petioles, the blades firm-membranaceous, broadly ovate or oval, mostly 5–9 cm. long, acuminate to rounded and abruptly cuspidate-acumi-

nate, usually deeply cordate at the base; racemes mostly elongate and arranged in lax panicles, densely or sparsely flowered; achene included in the perianth. Negs. 4983, 4979.

Arequipa: Quequeña, *Isern 2036*.—Cajamarca(?): Palco, *Ruiz & Pavón*.—Above San Pablo (*Weberbauer 3806*).—Huánuco: Ambo, 2,100 meters, *3166*. Huánuco, *Ruiz*.—Without locality: *Ruiz & Pavón 13–97*.—Junín: Huacapistana, *Weberbauer 2175* (determined by H. Gross as a new species).—Sandía: (*Weberbauer 648, 835*).—Ancash: Chiquián (*Weberbauer 2826*). Ancash (*Weberbauer 3164*). Northwestern Argentina and Bolivia to Colombia and Venezuela; Mexico and Central America.

M. leptobotrys (type collected near Huánuco by Ruiz; *Coccoloba carinata* Ruiz in herb. ex Meisn. in DC. Prodr. 14: 150. 1856) is merely a form with lax inflorescences. It may be called *M. tamnifolia* var. *laxiflora* Meisn., although it scarcely seems to deserve special designation.

Muehlenbeckia tiliifolia Wedd. Ann. Sci. Nat. III. 13: 255. 1850. *Calacinum tiliifolium* Macbr. Field Mus. Bot. 4: 117. 1927.

A large, more or less woody vine; ocreae very large and conspicuous, often long-persistent; leaves thin, slender-petiolate, the blades ovate or ovate-oval, mostly 5–13 cm. long, rounded and mucronate to abruptly cuspidate-acuminate at the apex, deeply cordate at the base, green and glabrate on the upper surface, densely puberulent or tomentulose beneath and often grayish; racemes elongate, usually very dense, in large or small panicles; achene often exserted from the perianth.

Ancash: Ocros, *Weberbauer 2733*.—Pampa Ramos (*Weberbauer 3187*).—Cuzco: Marcapata, 3,100 meters, *Weberbauer 7777*, flowers white; *7778*.—Huánuco: Huacachi, 1,950 meters, in clearing, *4165, 4189*; fruits red.—Lima: Viso, 2,700 meters, trailing over rocks and shrubs, *754*. Near Viscas, 2,100 meters, thickets along river, fruit purple-black, *Pennell 14447*. Bolivia.

Muehlenbeckia volcanica (Benth.) Endl. Gen. Suppl. 4, pt. 2: 51. 1847. *Polygonum volcanicum* Benth. Pl. Hartw. 81. 1841. *Sarcogonum volcanicum* Rusby, Mem. Torrey Club 4: 252. 1895. *Calacinum volcanicum* Macbr. Field Mus. Bot. 4: 115. 1927.

Plants depressed and forming small, dense mats, or sometimes ascending, the branches usually 30 cm. long or less, woody, glabrous throughout; ocreae small and soon deciduous; leaves subsessile,

fleshy-coriaceous, mostly rhombic-elliptic, acute or obtuse, cuneate-attenuate at the base, mostly 7–14 mm. long; flowers small, green, fasciculate in the upper leaf axils, short-pedicellate; achene enclosed in the perianth.—Illustrated, Wedd. Chlor. And. 2: *pl. 89*. Neg. 7432.

Ayacucho: Pampalca, 3,200 meters, open hillside, *Killip & Smith 23253*.—Ancash: Tallenga, 3,600 meters (*Weberbauer 2870*). Huaraz (*Weberbauer 3228*).—Cuzco: Colinas del Sacsahuamán, 3,500 meters, *Herrera 2350*. Paso de Tres Cruces, 3,900 meters, rocky banks, edge of paramo, *Pennell 13837;* fruit black.—Huánuco: Six miles south of Mito, 3,000 meters, stony, open slope, *1834*.—Tambo de Vaca, 3,900 meters, mossy, rocky upland, *4406*.—Junín: Carpapata, 2,400 meters, open hillside, *Killip & Smith 24344*; stems as much as 60 cm. long, prostrate. La Quinua, 3,600 meters, *2022*.—Lima: Río Blanco, 4,500 meters, *3002*. Canta, 2,700–3,200 meters, *Pennell 14339*. Huaros, 3,400 meters, rock slide, *Pennell 14714*. Río Blanco, 3,000–3,500 meters, creeping over rocks, *Killip & Smith 21546*. Matucana, 2,400 meters, *245*.—Puno: Araranca, 4,200 meters, ledges of siliceous rock, *Pennell 13453*. Asángaro, *Lechler 1748*.—Sandía: Cuyocuyo (*Weberbauer 849*).—Without locality: *Ruiz & Pavón*. Bolivia to Ecuador. "Mullaca," "pasamullaca," "zoczocmá."

5. COCCOLOBA L.

Reference: Lindau, Bot. Jahrb. 13: 106–229. 1890.

Trees or shrubs, usually glabrous or nearly so; ocreae coriaceous-membranaceous, cylindric, eciliate, truncate, deciduous; leaves often deciduous, usually coriaceous; flowers perfect, in spike-like, axillary or terminal, simple or rarely branched racemes, the bracts ocreiform, subtending several flowers, the pedicels short or elongate, articulate at the apex; calyx green or whitish, small, the 5 subequal segments united at the base, the tube or the lobes accrescent and enclosing the fruit, usually becoming much thickened and succulent; stamens 8, equal; achene subtrigonous-globose, small or large.—The genus is in need of critical revision in the light of recently accumulated material. Many of the species seem to be based upon vague or variable characters. The fleshy calyces at maturity are often very juicy and edible.

Flowers in panicled racemes.....*C. mollis*.

Flowers in simple racemes.

Calyx *tube* accrescent and enclosing the achene, the calyx lobes very small.

Leaves conspicuously short-pilose beneath, at least when young, short-acuminate, more or less cordate at the base. *C. excelsa.*

Leaves glabrous beneath, or barbate along the costa in the axils of the nerves.

Bracts and ocreolae 0.5 mm. long. Leaves large, obovate, cordate at the base.....*C. nutans.*

Bracts and ocreolae more than 1 mm. long.

Veinlets conspicuously elevated and closely reticulate on the upper leaf surface.....*C. sphaerococca.*

Veinlets inconspicuous on the upper leaf surface. *C. Barbeyana.*

Calyx *lobes* accrescent and enclosing the achene.

Leaves glabrous beneath, rounded at the apex, 4–7 cm. long. *C. Ruiziana.*

Leaves more or less pubescent beneath, at least on the costa, or barbate in the axils of the nerves.

Leaves large, mostly 7–12 cm. wide.....*C. Williamsii.*

Leaves smaller, chiefly 2–5 cm. wide.

Leaves narrowly lance-oblong, long-acuminate. *C. acuminata.*

Leaves elliptic to obovate, obtuse or acute.

Rachis of the inflorescence glabrous or nearly so; leaves mostly acute.....*C. peruviana.*

Rachis of the inflorescence short-pilose; leaves obtuse. *C. gracilis.*

Coccoloba acuminata HBK. Nov. Gen. & Sp. 2: 176. 1817.

A slender shrub or tree 2–6 meters high, reported to attain a height of 10 meters, the elongate branchlets glabrous or ferruginous-pubescent; leaves short-petiolate, the blades narrowly lance-oblong, long-acuminate, 12–20 cm. long, acute or acutish at the base, more or less puberulent beneath in the axils of the nerves, otherwise glabrous; racemes slender, spike-like, longer than the leaves, the rachis puberulent, the pedicels very short; fruits 6 mm. long, pink or bright red. Neg. 4939.

Loreto: Yurimaguas, 200 meters, in forest, *Williams 4651, 4606.* Portal, 135 meters, *Killip & Smith 29263.* Puerto Arturo, 135 meters, *Killip & Smith 27879;* edge of forest, *Williams 5271.*

Santa Rosa, 200 meters, in forest, *Williams 4804*. Contamana, 150 meters, dense forest, *Killip & Smith 26879*. Extending northward to Central America.

A well marked species because of the narrow, relatively thin, long-acuminate leaves. A handsome shrub when in fruit because of the great profusion of bright red racemes.

Coccoloba Barbeyana Lindau, Bot. Jahrb. 13: 185. 1890.

A shrub or tree, sometimes 8 meters high, glabrous throughout, with stout branches; leaves short-petiolate, coriaceous, the blades obovate-oblong to elliptic-oblong or obovate, mostly 9–27 cm. long, obtuse to acuminate or rounded and abruptly short-acuminate at the apex, obtuse or rounded at the base and sometimes shallowly emarginate, the lateral nerves very oblique, the veinlets prominulous and closely reticulate beneath; racemes rather slender, shorter or longer than the leaves, the pedicels slightly longer than the ocreolae, or sometimes more elongate; fruit subglobose, almost 1 cm. long.—Flowers described as cream-colored, white, or green.

Type collected in Peru by Ruiz and Pavón, the locality unknown. —Loreto: Puerto Arturo, 200 meters, in forest, *Williams 5138*. Florida, 180 meters, in forest, *Klug 2260*. Mishuyacu, 100 meters, in forest, *Klug 1077*. Yurimaguas, 200 meters, *Williams 4528*. Iquitos, 100 meters, *Killip & Smith 27494*. Rancho Indiana, overflowed creek bank, 110 meters, *Mexia 6426*. Río Huallaga, 135 meters, *Killip & Smith 29006*.—San Martín: Chazuta, 260 meters, in forest, *Klug 4127*. "Nemoño-o" (Huitoto name).

Coccoloba excelsa Benth. in Hook. Lond. Journ. Bot. 4: 624. 1845.

A scandent shrub, the young branches ferruginous-puberulent or glabrous; leaves short-petiolate, the blades coriaceous, broadly ovate to oval or rounded-obovate, 15–22 cm. long, obtuse to rounded at the apex and usually abruptly acuminate, slightly narrowed to the shallowly cordate base, glabrous above or nearly so, short-pilose beneath, at least when young, the veinlets prominent beneath and closely reticulate; racemes slender, shorter than the leaves, the rachis usually puberulent, the nodes 1–3-flowered, the pedicels equaling or longer than the ocreolae; fruit globose, 9 mm. long. Neg. 4958.

Loreto: Yurimaguas, edge of forest, 200 meters, *Williams 4538*. Amazonian Brazil, Surinam, and British Guiana.

Coccoloba gracilis HBK. Nov. Gen. & Sp. 2: 176. 1817. *C. peruviana* Willd. ex Lindau, Bot. Jahrb. 13: 214. 1890, in syn.

A shrub or tree of 3.5–6 meters, the branchlets stout, glabrous; leaves short-petiolate, coriaceous, the blades oblong-elliptic to elliptic, 5–7 cm. long, 2–4 cm. wide, obtuse, rounded or obtuse at the base, the veinlets scarcely prominent beneath, closely reticulate; racemes lax or dense, slightly longer than the leaves, the rachis short-pilose or puberulent, the nodes mostly 1–2-flowered, the pedicels 2 mm. long. Neg. 4945.

Loreto: Río Cachiyaco, *Humboldt*, type.—Without locality: *Weberbauer 6982*.

Coccoloba mollis Casar. Nov. Stirp. Bras. Dec. 8: 72. 1842–45. *C. polystachya* Wedd. Ann. Sci. Nat. III. 13: 261. 1850.

A small or medium-sized tree, the branches glabrous; leaves short-petiolate, subcoriaceous, broadly ovate to oblong-ovate, 12–25 cm. long, acuminate or long-acuminate, cordate to truncate at the base, minutely puberulent or glabrate; racemes slender, paniculate, the panicles often very large, the rachis tomentulose, the nodes 1-flowered; flowers white; fruit ovoid, 1 cm. long. Neg. 21412.

Loreto: Florida, 200 meters, in forest, *Klug 1991*. Brazil, Ecuador, and the Guianas. "Tangarana" (Klug; signifying ant tree, and presumably indicating that the tree is inhabited by biting ants).

On young, sterile plants, as indicated by Ecuador material, the leaves are often extremely large, as much as 60 cm. long and 50 cm. wide.

Coccoloba nutans HBK. Nov. Gen. & Sp. 2: 175. 1817.

A tree, the branchlets glabrous; leaves petiolate, subcoriaceous, the blades obovate, 20 cm. long and 13 cm. wide, short-acuminate, cordate at the base, glabrous, the veinlets prominulous and closely reticulate; racemes dense, nutant, the nodes 1-flowered, the flowers in bud almost sessile.—Known to the writer only from the descriptions.

Libertad: Trujillo, *Bonpland* (type).

Coccoloba peruviana Lindau, Bot. Jahrb. 13: 213. 1890.

A rather slender shrub or small tree, the branchlets somewhat puberulent; leaves short-petiolate, chartaceous, the blades oblong-obovate, 5.5–12 cm. long, acute or acuminate, narrowed to the acute base, tomentose or barbate beneath along the nerves, the venation closely reticulate but not conspicuous; racemes dense, shorter than

the leaves, the rachis glabrous or nearly so, the nodes 1-flowered, the pedicels 1.5 mm. long. Neg. 4960.

Loreto: Caballo-cocha, in forest, *Williams 2482.*—San Martín: Juan Guerra, 720 meters, in forest, *Williams 6847, 6852.*—Without locality: *Ruiz & Pavón 229* (type), *13–89.* "Cunchu-caspi."

Coccoloba Ruiziana Lindau, Bot. Jahrb. 13: 215. 1890.

A shrub or tree, as much as 5 meters high, the branchlets obscurely puberulent or glabrate; leaves short-petiolate, chartaceous, the blades subovate to oblong or more often rounded-obovate, 3–7 cm. long, 2–5 cm. wide, broadly rounded to obtuse at the apex, shallowly cordate at the base, glabrous, the venation prominulous, laxly reticulate; racemes usually much longer than the leaves, dense, the rachis puberulent, the nodes 1–5-flowered, the pedicels 1.5–2 mm. long; fruits globose, scarcely 5 mm. long. Neg. 27791.

Lambayeque: Supo, 1,450 meters, *Townsend A135;* a form with very small leaves.—Piura: Between Frías and Chulucanas, 300–400 meters, *Weberbauer 6435.* Negritos, *Haught F15.*—Túmbez: Between Haciendas Casitas and Ricaplaya, 100 meters, dry river bed, *Weberbauer 7738.*—Without locality, *Ruiz & Pavón* (type). Also in Ecuador. "Liquanco" (Ruiz & Pavón), "añalque."

Coccoloba sphaerococca Lindau, Bot. Jahrb. 13: 185. 1890.

Reported as a shrub, a tree, or a woody vine, the stout branchlets glabrous; leaves on short, thick petioles, coriaceous, the blades oblong-ovate to broadly elliptic or rounded-obovate, 7–20 cm. long, 4–11 cm. wide, rounded or very obtuse at the apex, sometimes obtuse-acuminate, rounded or obtuse at the base, often very lustrous, glabrous, the venation closely reticulate and prominent; racemes dense, usually longer than the leaves, the rachis glabrous, the pedicels slightly longer than the ocreolae; fruit globose, 7 mm. in diameter.

Loreto: Yurimaguas, in pasture, 200 meters, *Williams 3805;* in forest, *Killip & Smith 29027, 27958.*—San Martín: Tarapoto, *Spruce* (type).

Coccoloba Williamsii Standl. Field Mus. Bot. 11: 148. 1936.

A shrub or tree, said to be sometimes scandent, the branchlets stout, glabrous; ocreae as much as 3 cm. long; leaves petiolate, coriaceous, the blades oval, oblong-oval, or oblong-elliptic, 12–20 cm. long, 7–12 cm. wide, obtuse or rounded at the apex and sometimes short-acuminate, more or less oblique at the rounded base,

sometimes shallowly emarginate, puberulent beneath along the costa and nerves, elsewhere glabrous; racemes 20–25 cm. long, the rachis densely puberulent or pilose, the nodes 1–3-flowered, the pedicels in anthesis shorter than the ocreolae; fruit purple, ovoid-globose, 5–6 mm. in diameter.

Loreto: Lower Río Huallaga, 200 meters, *Williams 4803* (type). Yurimaguas, in forest, *Williams 4597; Killip & Smith 28304*. Lower Río Nanay, *Williams 673*. Caballo-cocha, in forest, *Williams 2423*. Florida, 180 meters, in forest, *Klug 2240*. "Palo meta-caspi," "tangarana mashau," "eseri-ey" (the last a Huitoto name).

6. SYMMERIA Benth.

Shrubs or small trees; leaves alternate, coriaceous, the petiole subvaginate, no true ocreae present; flowers small, dioecious, paniculate, the staminate small, subsessile and glomerate, the pistillate larger, pedicellate; staminate calyx 6-parted, spreading, the segments orbicular, the 3 outer ones smaller; stamens numerous, the filaments very short; pistillate calyx 6-parted, the outer segments small, oblong, not accrescent, the inner ones cordate-ovate, erect-connivent, accrescent and closely investing the 3-angulate achene. —The genus consists of a single species.

Symmeria paniculata Benth. in Hook. Lond. Journ. Bot. 4: 630. 1845.

A shrub or small tree, sometimes 8 meters high, the young branches and inflorescence somewhat ferruginous-tomentulose, otherwise glabrous or nearly so; leaves short-petiolate, coriaceous, the blades oval to oblong, mostly 10–20 cm. long and 2.5–10 cm. wide, obtuse or acutish, rounded or cordate at the base; staminate panicles large, open, with slender branches, the pistillate panicles smaller; fruiting bracts 12–18 mm. long.—Flowers described as yellowish, brown-yellow, and golden yellow. Illustrated, Mart. Fl. Bras. 5, pt. 1: *pl. 23*.

Loreto: Río Masana, *Williams 8, 101, 8150, 8145*. Mishuyacu, 100 meters, in forest, *Klug 727, 457, 1181*. Iquitos, 120 meters, *Williams 7993*. Amazonian Brazil, Guianas, and Colombia. "Tangarana" (ant tree; presumably inhabited by ants, like *Triplaris*). Sometimes called "manguirana" in Amazonian Brazil.

7. RUPRECHTIA C. A. Mey.

Shrubs or trees; ocreae deciduous; flowers dioecious, fasciculate within small bracts, arranged in simple or paniculate racemes;

perianth 6-parted; stamens 9; outer segments of the pistillate perianth erect, narrow, greatly enlarged in fruit and bright-colored, the 3 inner ones small, linear, sometimes minute or obsolete; achene obtusely 3-angulate, pyramidal, 3- or 6-sulcate.

Leaves acute or acuminate; inner segments of the pistillate perianth obsolete ..... *R. apetala.*

Leaves obtuse or rounded at the apex; inner segments of the pistillate perianth developed ..... *R. Jamesonii.*

Ruprechtia apetala Wedd. Ann. Sci. Nat. III. 13: 268. 1849.

A shrub; leaves short-petiolate, subcoriaceous, the blades ovate to oblong or obovate, 2.5–6.5 cm. long, acute or acuminate, obtuse or subacute at the base, entire or undulate, soft-pilose beneath or glabrate; staminate racemes slender, lax, longer than the leaves, the flowers short-pedicellate; fruiting perianth 2.5 cm. long, pubescent, the segments oblong-lanceolate, obtuse, 3-nerved. Neg. 7414.

Cajamarca: Between Jaén and Bellavista, 600 meters, *Weberbauer 6206.*—Without locality: *Ruiz & Pavón 33–98.* Bolivia; a variety reported from Amazonian Brazil.

The Weberbauer collection is staminate. It is not certain that the Ruiz and Pavón collection is really conspecific with Weddell's type.

Ruprechtia Jamesonii Meisn. in DC. Prodr. 14: 179. 1857.

A shrub 1.5–4 meters high; leaves short-petiolate, coriaceous, the blades oblong to oval or broadly obovate, mostly 3–7.5 cm. long and 1.5–5 cm. wide, obtuse or rounded at the apex, obtuse at the base, glabrate above, densely velutinous-pilose beneath with short hairs or finally glabrate, the venation very prominent beneath and closely reticulate; racemes very dense, usually longer than the leaves; fruiting perianth 2.5–3 cm. long, the outer segments glabrate, bright red or purplish red, linear-oblong or oblong-spatulate, obtuse or rounded at the apex, the 3 inner segments very short, subulate.

Piura: Cerro Viento, 30 miles east of Talara, *Haught F29, 131a.* Caña Dulce, about 30 miles east of Cabo Blanco, *Haught F29.*—Túmbez: North of Túmbez, *Oleson; (Haught 131).* Also in Ecuador.

8. TRIPLARIS Loefl.

Trees, the branches usually hollow and septate; ocreae deciduous; leaves large, short-petiolate, often with 3–6 longitudinal, distant lines on each side of the costa, these indicating folds of the blade in bud; flowers dioecious, racemose, the racemes paniculate or fas-

ciculate, dense, the bracts small, ovate, acute, the ocreolae larger, long-acuminate, deeply slit on the anterior side; staminate perianth segments 6, subequal; stamens 9; segments of the pistillate perianth 6, the 3 outer ones connate into a short or elongate tube, in fruit greatly enlarged and colored with red, the 3 inner segments free or partially adnate to the tube, small and narrow, little if at all exceeding the tube, usually shorter; achene trigonous, the angles usually acute.—The genus is a difficult one because of the apparent inconstancy of most of the characters usually depended upon for separating species. The best characters for separation of species probably are those of the fruiting calyx, but since the majority of the Peruvian specimens are staminate, fruit characters alone are unsatisfactory for separating the forms. The genus is greatly in need of critical and careful revision. Several Peruvian specimens probably represent species additional to those recognized here, but material of them is insufficient for description. The branches of *Triplaris* trees practically always are inhabited by small ants that bite severely and painfully.

Branchlets hirsute or hispid, at least about the nodes.

Leaves rather densely and evenly hirsute on both surfaces. *T. fulva.*

Leaves glabrous or nearly so except for a few very long and stiff, appressed hairs along the costa..... *T. Poeppigiana.*

Branches glabrous or nearly so, the hairs, if any, appressed or strongly ascending.

Bracts of the inflorescence sparsely short-hispid near the apex, otherwise glabrous. Fruiting calyx 5–6 cm. long, glabrous; leaves oblong, acute or attenuate at each end, conspicuously black-punctate beneath..... *T. punctata.*

Bracts densely sericeous or pilose; fruiting calyx shorter, usually abundantly pilose.

Inner perianth lobes in fruit longer than the tube; pubescence of the inflorescence very short, mostly appressed, of silky or very stiff hairs; leaves usually oblong.

Outer lobes of the fruiting perianth little longer than the tube, with a large, rounded or emarginate lobe in each sinus; inner lobes spatulate-linear, not auriculate at the base..... *T. peruviana.*

Outer lobes of the perianth much longer than the tube, with only minute and inconspicuous lobes in the sinuses; inner lobes linear, auriculate at the base..... *T. auriculata.*

Inner perianth lobes in fruit shorter than the tube; pubescence of the inflorescence of long, spreading, silky hairs; leaves mostly elliptic to oval, conspicuously broadest at or near the middle.

Sinuses of the perianth tube naked.....*T. Pavonii.*

Sinuses bearing small lobes.....*T. Bonplandiana.*

Triplaris auriculata Meisn. in DC. Prodr. 14: 174. 1857.

Leaves oblong or ovate-oblong, 15–20 cm. long, short-acuminate, rounded or acute at the base, sparsely appressed-pilose or almost wholly glabrous; inflorescence densely grayish-sericeous; fruiting perianth (immature) as much as 3.5 cm. long, densely sericeous on both surfaces, the outer lobes lanceolate, 4–6 mm. wide, obtuse, the inner lobes linear, adnate to the tube for more than half their length.

The original locality is given as "In Nova-Granata? et Mexico (Pavón! in herb. Shuttlew.). T. Americana Pavón! mss." The specimens are unlike those of the only species known from Mexico, and are probably of South American origin. There is at hand a specimen from the Madrid Herbarium (*Ruiz & Pavón 33–99*), labeled as from Peru (or Chile). I suspect that the plant is the same as *T. guayaquilensis* Wedd. of Ecuador, and therefore to be excluded from the Peruvian flora, but it is included here because of the possibility of its Peruvian origin.

Triplaris Bonplandiana Wedd. Ann. Sci. Nat. III. 13: 262. 1849.

Branchlets glabrous; leaves unknown; tube of the fruiting perianth subglobose, subappressed-pilose on both surfaces, the sinuses dentate, 18 mm. long, the outer lobes oblong, obtuse, the inner segments linear, adnate at the base to the tube, much shorter than the achene.

The type was collected by Bonpland in "prov. Marannon" (Marañón), presumably somewhere in eastern Peru. Meisner (in DC. Prodr. 14: 174) associates with it "T. americana Bonpl. mss. n. 3599! in herb. Kunth." The type was without leaves, but the leaves of this specimen are described by Meisner as follows: Leaves oblong, 10–12.5 cm. long, 4–7.5 cm. wide, attenuate-acuminate at each end, glabrous above, puberulent beneath, the lateral lines obsolete. I have seen nothing to represent the species, and have been unable to associate any of the available material with it.

Triplaris fulva Huber, Bol. Mus. Goeldi 4: 560. 1906.

Petioles only 5 mm. long, the blades oblong, acutely acuminate, unequal at the base and rounded or subcordate, membranaceous, hirsute on both sides with fulvous hairs; petioles and branchlets densely fulvous-hirsute.

Loreto: Paca, Río Ucayali, *Huber 1565*, type.

The species, strangely enough, was based upon a sterile branch, apparently taken from a young plant. I have seen a portion of a leaf of the original material, which shows that the leaf pubescence is distinctive for the specimen, but it may not be characteristic for mature material. It is probable that the proper treatment of the name will remain obscure until the type locality is revisited. As a matter of fact, it is not altogether certain that the plant belongs to the genus *Triplaris*.

Triplaris Pavonii Meisn. in DC. Prodr. 14: 172. 1857. *T. boliviana* Britton, Bull. Torrey Club 27: 130. 1900.

A small or medium-sized tree, 5–16 meters high, the stout branchlets glabrous or nearly so, the much branched, ample inflorescence densely sericeous-villous with soft, spreading, long, pale hairs; leaves large, short-petiolate, usually subcoriaceous, glabrous or nearly so in age, mostly elliptic and acute at each end or abruptly short-acuminate at the apex, the lateral nerves numerous and close together; fruiting perianth about 3.5 cm. long, densely pilose on both surfaces, the tube ovoid, the outer lobes obtuse, narrowly oblanceolate, obtuse or rounded at the apex, red or purple-red, the inner lobes lance-linear, shorter than the tube.

Cuzco: Cuquipata, *Diehl 2436* (determination very doubtful; perhaps undescribed, but material unsatisfactory; vernacular name Palo santo).—Junín: La Merced, 600 meters, on river cliff, *5448*.—Loreto: Lower Río Nanay, *Williams 424*. Yurimaguas, 200 meters, *Williams 4176*. Cachipuerto, 250 meters, in forest, *Klug 3134* (very doubtful, perhaps new; staminate, the large, thin leaves densely and softly pubescent beneath). Mishuyacu, 100 meters, *Klug 947;* staminate flowers cream-colored. Pongo de Manseriche, *Killip & Smith 29124*. Florida, 200 meters, riverside forest, *Klug 2162, 2087*.—San Martín: Zepelacio, 1,100 meters, *Klug 3656* (leaves rounded or subcordate at the base; perhaps a different species).—Without locality: *Ruiz & Pavón 34–1* (probably type material; fruiting perianths only), *33–94, 33–98*. Bolivia and Amazonian Brazil. "Tangarana," "maicharo-ey" (Huitoto name).

Like other species of the genus, this is a handsome and exceedingly showy tree when covered with the mature pistillate inflorescences, which are brightly colored in various shades of red, and remain upon the tree for a long time.

Triplaris peruviana Fisch. & Mey. Mém. Acad. St. Pétersb. VI. 6: 149. 1845.

A tree 3–16 meters high, the stout branchlets glabrous; leaves coriaceous, on short, stout petioles, the blades oblong, acuminate, acute to obtuse at the base, glabrous or nearly so, the lateral nerves rather few and distant; fruiting perianth about 3.5 cm. long, sparsely appressed-pilose or almost glabrous, the tube tubular-campanulate, the outer segments little longer than the tube, narrowly oblong, obtuse or rounded at the apex, each sinus with a large, ovate lobe. Neg. 8490.

Loreto: Timbuchi, *Williams 1008*. Florida, 200 meters, in forest, *Klug 2057* (uncertain, perhaps somewhat abnormal; if not referable here, the species must be undescribed). Río Huallaga, *Stuebel 1*. Mishuyacu, 100 meters, in forest, *Klug 1451;* staminate flowers white.—San Martín: Chazuta, in forest, 260 meters, *Klug 4153*.—Without locality: *Mathews 1620* (type). Amazonian Brazil. "Tangarana," "tangarana blanca."

Triplaris Poeppigiana Wedd. Ann. Sci. Nat. III. 13: 265. 1849. *Blochmannia peruviana* Poepp. ex Meisn. in DC. Prodr. 14: 173. 1857, in syn. *T. hispida* Britton, Mem. Torrey Club 6: 111. 1896. *T. longifolia* Huber, Bol. Mus. Goeldi 4: 559. 1900.

A shrub or tree, sometimes 20 meters high, the stout branchlets sparsely hispid with very long, spreading, stiff, brownish hairs; leaves large, oblong, acuminate or cuspidate-acuminate, usually rounded or obtuse at the base, sometimes cordate, the lateral nerves numerous and rather close together, sparsely hispid or appressed-hispid beneath along the costa, otherwise glabrous or nearly so, or sometimes sparsely hispid over almost the whole lower surface; branches of the broad inflorescence more or less hispid with long, stiff, fulvous hairs; fruiting perianth about 5 cm. long, the tube sparsely or densely hirsute, the outer segments linear-oblong, twice as long as the tube, obtuse, the inner lobes lanceolate, short, adnate at the base to the tube.—Negs. 27773, 4972.

Junín: La Merced, 600 meters, in forest, *5401*. Puerto Yessup, 400 meters, in forest, *Killip & Smith 26392, 26342*. Río Pichis, 350 meters, *Killip & Smith 26700*. Río Paucartambo Valley, 700

meters, *Killip & Smith 25244*.—Loreto: Cerro de Canchahuaya, *Huber 1458*, type material of *T. longifolia*.—San Martín: Tocache, *Poeppig 1957* (type).—Without locality: *Ruiz & Pavón 33–97*. Also in Bolivia and doubtless in Amazonian Brazil.

T. longifolia was based upon sterile material taken, apparently, from a young shoot. I have seen a leaf of the original material, and this shows along the costa a few of the long, stiff hairs that are so characteristic for this species.

Triplaris punctata Standl., sp. nov.

Arbor 10–18-metralis, ramulis crassis glabris brunneo-puncticulatis; folia breviter petiolata crasse membranacea in sicco olivaceo-viridia, petiolo crasso 1–1.5 cm. longo; lamina anguste lanceolato-oblonga 18–30 cm. longa 4.5–8 cm. lata anguste attenuato-acuminata, basi plus minusve inaequali acuta, glabra, subtus ubique dense puncticulis nigrescentibus notata, costa gracili elevata, nervis lateralibus numerosis approximatis angulo acuto adscendentibus, striis obsoletis; racemi masculi fasciculati densissimi 7–17 cm. longi, rhachi glabra vel obscure puberula, bracteis latis tantum prope apicem hispidulis, aliter glabris, sepalis strigosis, staminibus bene exsertis; racemi fructiferi breves densi, rhachi glabra; perigonium fructiferum in sicco pallidum omnino glabrum circa 5.5 cm. longum, tubo late campanulato vix ultra 1 cm. longo, sinu lobulo ovato brevi acuminato onusto, alis oblongis tubo triplo longioribus obtusis 10–12 mm. latis arcte reticulato-venosis, lobis interioribus lineari-subulatis tubo brevioribus media longitudine tubo adnatis; achaenium 13 mm. longum ovoideum profunde 3-sulcatum, angulis valde compressis alariformibus.

Loreto: Balsapuerto, 220 meters, in forest, *Klug 3009;* staminate flowers cream-colored.—Brazil: Near mouth of Rio Macauhan, a tributary of Rio Yaco, Territory of Acre, on terra firma, *Krukoff 5277* (Herb. Field Mus., type; in fruit), *5333* (staminate).

The species is well marked because of its long, narrow leaves, glabrate inflorescence, and large, glabrous fruiting perianths. The conspicuous dark dots of the lower leaf surface are not confined to this species, but they are more noticeable than in any other I have observed. The leaves are strikingly like those of *T. longifolia* Huber, but in that there are no black dots, and this plant does not have the distinctive, long hairs found on the lower leaf surface in *T. longifolia*, i.e., *T. Poeppigiana*.

59. CHENOPODIACEAE. Goosefoot Family

By Paul C. Standley

Herbs or shrubs, the pubescence often of minute, inflated hairs, the stems sometimes jointed; leaves opposite or alternate, without stipules, never regularly serrate; flowers perfect or unisexual, usually small and greenish, solitary or glomerate, often arranged in spikes or cymes; perianth simple, herbaceous or membranaceous, normally of 2–5 segments, these united below, often enlarged in fruit; stamens usually 2–5, the filaments slender, the anthers dorsifixed, 4-celled; ovary superior, 1-celled; stigma capitate, or the styles 2–3, or the stigmas 2–5 and sessile; ovule solitary; fruit a utricle, containing a single small seed.

Besides the species and genera listed below, the beet (remolacha; *Beta vulgaris* L.) and spinach (espinaca; *Spinacia oleracea* L.) sometimes are cultivated as edible vegetables in Peru.

Stems jointed, fleshy; leaves reduced to minute scales; flowers sunken in groups of 3–5 in the joints of the stem . . 1. *Salicornia.*

Stems not jointed; leaves usually well developed; flowers not sunken in the stem.

Embryo spirally coiled; leaves terete or semiterete, very fleshy; flowers all axillary . . . . . 2. *Suaeda.*

Embryo not spirally coiled; leaves flat; flowers often spicate or cymose.

Flowers perfect, not bracteolate . . . . . 3. *Chenopodium.*

Flowers unisexual, the pistillate ones subtended by 2 bracteoles, these enlarging with age and enclosing the fruit. 4. *Atriplex.*

1. SALICORNIA L.

Annuals or perennials, sometimes suffrutescent, fleshy, glabrous, with jointed branches, the joints dilated at the apex into a short sheath; flowers perfect or polygamous, immersed in groups of 3–7 on opposite sides of the joints, the flowering joints forming cylindric, terminal spikes; perianth obpyramidal, fleshy, 3–4-dentate; stamens 1–2; fruit a minute utricle, included in the perianth; seed erect, compressed, minutely hairy.

Salicornia fruticosa L. Sp. Pl. ed. 2. 5. 1762. *S. peruviana* HBK. Nov. Gen. & Sp. 2: 193. 1817. *S. Gaudichaudiana* Moq. Chenop. Enum. 115. 1840. *S. biloba* Kunze ex Fenzl in Mart. Fl.

Bras. 5, pt. 1: 158. 1864, in syn. *S. Neei* Lag. Mem. Pl. Barrill. 51. 1817. *S. equisetifolia* Willd. ex Moq. loc. cit. as syn.

An erect or prostrate perennial, suffrutescent at the base, much branched, the secondary branches ascending or erect, usually branched, the joints mostly 1–2 cm. long; sheaths rounded or with acutish lobes; flower spikes about 2 cm. long and 3 mm. thick, the flowers in groups of 3; seed yellowish brown, covered with short, conic hairs. Neg. 7354 (*S. Gaudichaudiana*).

Arequipa: Mollendo, *R. S. Williams 2543.*—Lima: Lurín, in salt marsh, *5931.* Callao, *Wilkes Expl. Exped.* Type of *S. peruviana* collected by Humboldt and Bonpland near Huarmei (Dept. Lima). Widely distributed on seashores of both hemispheres.

2. SUAEDA Forsk.

Annuals or perennials, erect or prostrate, glabrous or pubescent, herbaceous or suffrutescent; leaves alternate, terete or semiterete, rarely flat, entire, fleshy; flowers minute, chiefly perfect, solitary or glomerate in the leaf axils; perianth fleshy, 5-lobed; stamens 5; fruit a compressed or depressed utricle, enclosed in the perianth; seed horizontal or erect, smooth or roughened.

Suaeda foliosa Moq. in DC. Prodr. 13, pt. 2: 156. 1849.

Apparently perennial, glabrous or nearly so, much branched, the stout branches roughened by the persistent leaf bases of fallen leaves; leaves mostly 5–8 mm. long, glaucous, very thick and fleshy, obtuse or acutish, semiterete, glabrous; flowers minute, green, solitary or in clusters of 3. Neg. 7356.

Lima: Lima and Callao, *Wilkes Expl. Exped.* Lima, *Rose 18576.* Type said to have been collected somewhere in Peru by Gaudichaud. Also in Chile.

Suaeda foliosa var. **tenuifolia** (Phil.) Standl., comb. nov. *S. tenuifolia* Phil. Anal. Univ. Chile 91: 432. 1895. *S. divaricata* Moq. var. *tenuifolia* Reiche, Fl. Chil. 6: 175. 1911.

Leaves longer and proportionately narrower, as much as 18 mm. long; flowers in clusters of 3–5.

Arequipa: Tingo, 2,200 meters, open, rocky places, *Pennell 13104.*—Lima: Chorrillos, near Lima, 150 meters, loose, stony, seaside slopes, *5867.* Also in Chile.

3. CHENOPODIUM L.

Annual or perennial herbs, often strong-scented, usually either glandular or covered with a mealy pubescence of small, white,

inflated hairs; leaves alternate; flowers perfect or rarely unisexual, chiefly 5-parted; perianth calyx-like, herbaceous, with usually 5 lobes, these often keeled dorsally, persistent; stamens 5 or fewer; fruit a utricle, erect or depressed, free from or adherent to the seed; seed horizontal or vertical, the embryo completely or incompletely annular.

Seed vertical. Plants white-villous when young; leaves deeply pinnatifid.....*C. multifidum.*

Seed horizontal.

Embryo not completely encircling the endosperm; leaves and inflorescence glandular.

Pericarp gland-dotted; flowers in spikes.....*C. ambrosioides.*

Pericarp not gland-dotted; inflorescence dichotomous, some of the flowers pediceled.....*C. incisum.*

Embryo completely encircling the endosperm; plants without glands.

Leaves lustrous on the upper surface, rhombic. Inflorescences chiefly axillary.....*C. murale.*

Leaves dull on the upper surface.

Seeds white or nearly so.....*C. Quinoa.*

Seeds black or blackish.

Inflorescence naked or almost so, usually with many slender, spreading branches. Plants tall and much branched, slender; seed about 1 mm. broad....*C. petiolare.*

Inflorescence usually very leafy, dense, the branches stout, chiefly erect.

Plants low and spreading; leaves small, 1–2 cm. long and wide, fleshy; seed about 1.2 mm. broad.
C. pallidicaule.

Plants tall, erect, stout; leaves much larger, thin; seed about 1.8 mm. broad.....*C. hircinum.*

Chenopodium ambrosioides L. Sp. Pl. 219. 1753. *C. anthelminticum* L. Sp. Pl. 220. 1753.

Plants evil-scented, erect or ascending, 1 meter high or usually less, annual or perennial, glabrous or puberulent, usually glandular-villous about the inflorescence; lower leaves petiolate, the blades oblong to ovate or lanceolate, 3–12 cm. long, coarsely sinuate-dentate or sinuate-pinnatifid, conspicuously gland-dotted; flowers

glomerate, forming short or elongate, leafy or naked spikes; uppermost leaves narrow, frequently spatulate or linear, often entire; seed 0.6–0.8 mm. broad, black.

Cuzco: San Sebastián, 3,300 meters, *Herrera 557* (reported by Aellen). Cuzco, *Herrera 142* (ex Aellen).—Huánuco: Mito, 2,700 meters, a weed in corral, *1703*.—Lima: Lima, 150 meters, roadsides, *70*.—Loreto: Iquitos, *Williams 3556, 7914*. Lower Río Nanay, *Williams 339*. Yurimaguas, 200 meters, *Williams 4048*. Mishuyacu, in clearing, *Klug 117*. Fortaleza, Yurimaguas, in garden, *Williams 4499*. Aripari, 150 meters, *Killip & Smith 29178*. Santa Rosa, 135 meters, in clearing, *Killip & Smith 28868*.—San Martín: Tarapoto, *Williams 6247, 6189*. Generally distributed in tropical America, and naturalized in the United States and many regions of the Old World.

"Paico" (Amazon Valley), "camatai," "cashiva" (Mito). The plant has an exceedingly offensive odor, which is retained in dried specimens. Although widely dispersed in tropical America, this species seldom is abundant, and is confined chiefly to the vicinity of dooryards and barnyards. In Peru it sometimes is cultivated as a medicinal plant, being employed locally as a remedy for intestinal parasites and for affections of the stomach. The seeds are the wormseed or Mexican wormseed of the pharmacopoeia, being considered a highly efficient vermifuge.

Chenopodium ambrosioides L. subsp. **chilense** (Schrad.) Aellen, Repert. Sp. Nov. 26: 36. 1929. *C. chilense* Schrad. Ind. Sem. Hort. Goett. 1832: 2. 1832. *C. vagans* Standl. N. Amer. Fl. 21: 26. 1916.

Similar to the species, frequently suffrutescent; stems often more or less white-villous; leaves chiefly smaller than in the typical form and more deeply pinnatifid, the uppermost leaves commonly coarsely dentate or deeply pinnatifid.

Ancash: Recuai, 2,700 meters, rock cliffs, forming clumps, *2518*.—Puno: Azángaro, 4,000 meters, *Weberbauer* (ex Aellen). Puno, 4,000 meters, *Soukup 222*. Ranging to Chile, Argentina, and Brazil, and adventive in California.

Macbride reports the vernacular name as "amush," and states that the plant is employed as a remedy for insect bites.

Chenopodium hircinum Schrad. Ind. Sem. Hort. Goett. 1833: 2. 1833. *C. hircinum* subsp. *eu-hircinum* Aellen, var. *andinum* Aellen, Repert. Sp. Nov. 26: 122. 1929.

Plants tall and coarse, erect, the pale stems more or less striate; leaves long-petiolate, broadly rhombic, coarsely sinuate-dentate or often somewhat 3-lobate, green but sparsely and minutely mealy; inflorescence dense, narrow, leafy, loosely mealy.

Junín: Tarma, 2,100 meters, along trail, *1024* (type of var. *andinum*). Huancayo, 3,400 meters, *Weberbauer 6597*. The species in its various subspecies, varieties, and forms has been reported from most of the South American countries. In general appearance the plant is similar to the common *C. album* of the United States and Europe. Called "sacha-quinua" in Ecuador.

Chenopodium incisum Poir. in Lam. Encycl. Suppl. 1: 392. 1811. *C. incisum* var. *Bangii* Murr, f. *rotundifolium* Aellen, Repert. Sp. Nov. 26: 40. 1929.

An erect annual, 60 cm. high or less, strong-scented, often much branched, sparsely pubescent or glabrate, glandular; leaves petiolate, the blades deltoid to oblong or rounded, sinuate-pinnatifid or laciniate-pinnatifid, bright green, bearing many yellow glands on the lower surface; inflorescence of numerous loosely few-flowered, axillary cymes; flowers sessile in the forks of the cymes and solitary at the ends of the slender lateral branches, the pedicellate flowers chiefly abortive, their pedicels becoming spinose; seed 0.5–0.8 mm. broad, dark brown. "Arcapaico" (Cook).

Arequipa: Tingo, 2,200 meters, open, rocky slope, *Pennell 13128*. Arequipa, 2,500 meters, open, gravelly soil, *Pennell 13166*.—Cuzco: Ollantaitambo, 3,000 meters, *Cook & Gilbert 807*. Temple of Viracocha, near Tinta, 3,500 meters, among volcanic rocks, *Cook & Gilbert 208* (type of f. *rotundifolium*). In its various forms the species ranges to Argentina and northward to southwestern United States.

One of the Peruvian collections has been referred to *C. graveolens* Lag. & Rodr. That is an older name than *C. incisum*, and may pertain to the same plant, but its identity is doubtful.

Chenopodium multifidum L. Sp. Pl. 220. 1753. *Roubieva multifida* Moq. Ann. Sci. Nat. II. 1: 293. 1834.

A prostrate perennial, strong-scented, much branched, the branches usually short and more or less villous; leaves oblong, 1–4.5 cm. long, sparsely villous and glandular, deeply pinnatifid or the lowest merely coarsely lobed; flowers green, solitary or clustered n the leaf axils, sessile; seed 1 mm. in diameter, black and shining.

Reported by Aellen (Repert. Sp. Nov. 26: 41. 1929) from Peru, *Dombey 217*. The record is doubtful. The species occurs in Chile, Argentina, and Brazil, and is adventive occasionally in other parts of the world.

Chenopodium murale L. Sp. Pl. 219. 1753.

An erect or ascending annual, rarely more than 50 cm. high, bright green but somewhat mealy, usually much branched from the base; leaves slender-petiolate, the blades chiefly ovate-rhombic, 3–8 cm. long, irregularly sinuate-dentate; flowers mealy, sessile, the small glomerules arranged in lax or dense, chiefly leafless cymes or panicles; seed 1.2–1.5 mm. broad, finely puncticulate.

Arequipa: Tingo, 2,200 meters, open, rocky slopes, *Pennell 13145*. Arequipa, *Rose 19007*.—Junín: Tarma, 2,100 meters, mud wall of old house, *1019;* moist ditch, *Killip & Smith 21880*.—Lima: Chorrillos, near Lima, 150 meters, along trail on seaside hill, *5876*. Lima, 150 meters, roadside, *67*. A native of the Old World, but naturalized as a weed in many parts of America. "Yerba de gallinazo" (Cook).

Chenopodium pallidicaule Aellen, Repert. Sp. Nov. 26: 126. 1929.

Plants low and much branched, 50 cm. high or less, sparsely and coarsely mealy, pale; leaves long-petiolate, the blades 2 cm. long or less, thick and fleshy, shallowly trilobate, attenuate at the base to the petiole, the uppermost leaves sagittate or entire; flower spikes shorter than the leaves, axillary; seed minutely and irregularly punctate.

Puno: Santa Rosa, south side of La Raya Pass, 400 meters, *Cook & Gilbert 161* (type). Between Santa Rosa and Araranca, *Cook & Gilbert 170*.—Junín: Oroya, *Kalenborn 129* (determination uncertain). Also in Bolivia.

Aellen names also a forma *purpureum* (based on part of the type number), in which the plant is more or less tinged with red.

Chenopodium petiolare HBK. Nov. Gen. & Sp. 2: 191. 1817. *C. paniculatum* Hook. Bot. Misc. 2: 237. 1831. *C. paniculatum* var. *reniforme* Murr, Bull. Herb. Boiss. II. 4: 994. 1904. *C. paniculatum* var. *incanum* Murr, Allg. Bot. Zeitschr. 12: 54. 1906. *C. petiolare* f. *incanum* Aellen, Repert. Sp. Nov. 26: 150. 1929. *C. petiolare* f. *Hookeri* Aellen, loc. cit. *C. petiolare* f. *hastatum* (Phil.) Aellen, loc. cit. *C. petiolare* f. *scutatum* Aellen, Repert. Sp. Nov. 26: 151. 1929.

C. petiolare f. *trilobum* Aellen, loc. cit. *C. petiolare* f. *reniforme* Aellen, loc. cit.

Plants erect or spreading, slender, much branched, pale, the branches rather densely mealy; leaves slender-petiolate, the blades thin, densely farinose or sometimes green and glabrate, very variable in outline, small, usually more or less deltoid and distinctly hastate-lobate at the base, otherwise entire or remotely sinuate-dentate; inflorescence large and open, much branched, the spikes slender and much interrupted, naked or with few reduced leaves.

Arequipa: Arequipa, *Rose 19006;* gravel ridges along stream bed, 2,800 meters, *Pennell 13252.* Posco, 550 meters, *Cook & Gilbert 41a.* Mollendo, on benches and sheltered places, *Johnston 3561;* sandy desert hills, *Hitchcock 22363.*—Ayacucho: Coracora, 2,900 meters, *Weberbauer 5797.*—Cuzco: Ollantaitambo, 3,000 meters, a weed in cultivated ground, *Cook & Gilbert 432.*—Junín: Tarma, 3,600 meters, along trail, *1072.*—Lima: Matucana, 2,400 meters, gravelly river canyon slope, *242.* Chorrillos, near Lima, 150 meters, in rocks on upper slopes of seaside hills, *5873.* San Gerónimo, Lima, 150 meters, rocky slope, *5901.* Río Chillón, near Viscas, 1,900 meters, bare, open, loam slopes, *Pennell 14453.* Lima, *Rose 18590.*—Moquehua: Torata, 3,200 meters, *Weberbauer 7465.* The species ranges from Ecuador to Bolivia and Chile. "Lipcha" (Cook).

The forms named by Aellen are based upon variations in leaf form, which are of slight importance.

Chenopodium Quinoa Willd. Sp. Pl. 1: 1301. 1797. *C. purpurascens* Jacq. var. *punctulatum* Moq. in DC. Prodr. 13, pt. 2: 67. 1849. *C. Nuttalliae* Safford, Journ. Wash. Acad. Sci. 8: 523. 1918. *C. Canihua* Cook, in herb. *C. Quinoa* f. *purpureum* Aellen, Repert. Sp. Nov. 26: 124. 1929.

A coarse, erect annual, frequently 1 meter high or more, sparsely and finely mealy, green or somewhat purplish (f. *purpureum*); leaves slender-petiolate, the blades large, broadly rhombic, sinuate-dentate, sometimes obscurely lobate at the base; inflorescences erect, leafy, very dense and compact; seeds whitish, about 1.5 mm. broad.

Cuzco: Tinta, *Cook & Gilbert 232.* Santa Rosa, 4,000 meters, *Cook & Gilbert 231.* Cuzco, 3,400 meters, in market, *Cook & Gilbert 84.*—Junín: Tarma, 3,100 meters, *Killip & Smith 21907.*—Puno: Pomata, 3,820 meters, *Weberbauer 7964.*—Without locality: *Ruiz & Pavón.* Also in Ecuador, Bolivia, and Argentina, and in Mexico. "Quinoa," "quinua," "canihua."

The plant has long been an important food staple in the Andes, where it is planted extensively for its nutritious seeds. Most commonly the fresh flower spikes are cooked and the whole is eaten, or else the seeds are stripped from the spikes with the teeth.

4. ATRIPLEX L.

Shrubs or herbs, more or less furfuraceous, farinose, or canescent with inflated hairs; leaves alternate or opposite; flowers monoecious or dioecious, usually glomerate, the glomerules axillary or disposed in solitary or panicled spikes; staminate perianth 3–5-parted; stamens 3–5; pistillate flowers bibracteolate, the bractlets accrescent, free or united, enclosing the fruit, the perianth usually none; seed erect or inverted, rarely horizontal.—The genus is most abundantly represented in arid regions, and there are numerous species in Chile and Argentina.

Plants prostrate, herbaceous; leaves small, mostly 4–8 mm. long. *A. serpyllifolia.*

Plants erect or ascending, often shrubby; leaves large, chiefly 1.5–6 cm. long.

Bracts foliaceous, dentate, usually 6–9 mm. long or longer; leaves mostly dentate or crispate..... *A. rotundifolia.*

Bracts not foliaceous, entire or nearly so, usually about 5 mm. long. *A. peruviana.*

Atriplex peruviana Moq. in DC. Prodr. 13, pt. 2: 102. 1849. *Chenopodium cinereum* Moq. Chenop. Enum. 27. 1840.

A shrub 1–2 meters high, much branched, grayish or whitish and densely farinose or furfuraceous throughout, the branches slender, pale; leaves slender-petiolate, the blades rhombic or broadly ovate to rounded, mostly 1.5–3 cm. long, entire or nearly so but often crispate; flowers monoecious, the staminate glomerules forming large and rather open, terminal panicles, the pistillate solitary or clustered in the leaf axils; fruiting bracts rhombic or broadly triangular, obtuse or acutish, densely furfuraceous. Neg. 7355.

Arequipa: Río de Lomas and Río Yanca, 1,900 meters, *Weberbauer 5757.* Río de Lomas, 700 meters, *Weberbauer 5747.* Río de Lomas, Acari, 900 meters, *Weberbauer 5735.* Tiabaya, 2,100 meters, rocky river bank, *Pennell 13088.*—Tacna: Candarave, 2,900 meters, *Weberbauer 7366, 7367.* The type is *Gaudichaud 68* from some unknown locality of Peru, and Moquin reports also a collection by Mathews. The species is reported by the same author from Chile.

It is uncertain whether the specimens cited really are referable to *A. peruviana*, since they do not agree quite satisfactorily with Moquin's descriptions. It is questionable, also, whether the specimens cited are specifically distinct from *A. rotundifolia*.

Atriplex rotundifolia (Moq.) Dombey ex Moq. Chenop. Enum. 70. 1840, in syn. *Obione rotundifolia* Moq. loc. cit. *A. Espostoi* Speg. Physis 2: 241. *f.* 1916.

Plants herbaceous or suffrutescent, coarse and stout, 50 cm. high or more, minutely farinose or more often green and glabrate, sparsely branched, the branches angulate; leaves slender-petiolate, the blades rather thin but sometimes thick and crispate, rounded-deltoid to broadly rhombic or ovate, commonly 4–6 cm. long, very obtuse or rounded at the apex, often coarsely dentate; flowers monoecious, the staminate heads in small but lax panicles, often blackish when dried, the pistillate solitary or clustered in the upper leaf axils; fruiting bracts variable but most of them large and greenish, finely farinose, deltoid or broadly rhombic, commonly tuberculate near the base.

Lima: San Lorenzo Island, 400 meters, *Weberbauer 5923; Wilkes Expl. Exped.* Near Lima, *Rose 18588.*—Without locality: *Weberbauer 5710.* Type collected in Peru by Dombey. Moquin reports also a specimen collected by Mathews. Type of *A. Espostoi* collected on the coast of Peru by Nicolás E. Esposto.

If all the collections cited above really belong to this species—some of them are incomplete—it is a remarkably variable one.

Atriplex Herzogii Standl. Field Mus. Bot. 11: 125. 1931. *A. serpyllifolia* Herzog, Med. Rijks Herb. 27: 11. 1915, not Bunge, 1877.

Perennial from a woody root, much branched, the branches 30 cm. long or less, pale, prostrate, forming dense mats; leaves subsessile, oblong to obovate, minute, whitish, obtuse or rounded at the apex and usually mucronate, entire, narrowed to the base; flowers monoecious, the staminate in few terminal heads scarcely exceeding the leaves, the pistillate axillary; fruiting bracts broadly rhombic or rounded, about 2 mm. long, finely dentate and usually tuberculate dorsally.

Junín: Tarma, 2,100 meters, dry wash on hillside, *1000.*—Arequipa: Tingo, 2,200 meters, *Pennell 13106.* Also in Bolivia.

This probably is the species reported by Moquin (in DC. Prodr. 13, pt. 2: 110. 1849) from Peru, collected by Pavón, provided that the specimen so reported was Peruvian. Another Pavón collection reported by Moquin (p. 113) likewise is probably *A. Herzogii*, if

really Peruvian. The Pennell collection was determined by Ulbrich as *A. prostrata* Phil., a Chilean species. The specimen is unsatisfactory, but may well be referable to *A. Herzogii*.

60. AMARANTHACEAE. Amaranth Family

By Paul C. Standley

Reference: Schinz, Nat. Pflanzenfam. ed. 2. 16c: 7–85. 1934.

Herbs or shrubs; leaves simple, opposite or alternate, without stipules; flowers small, usually inconspicuous and green, sometimes white or colored, perfect, monoecious, polygamous, or dioecious, usually spicate or capitate, the bracts and bractlets scarious; petals none; sepals 0–5, distinct or slightly united at the base, equal or the inner ones smaller; stamens 1–5, opposite the sepals, the filaments free or connate or united with the intervening pseudostaminodia; anthers 1–2-celled; ovary 1-celled, containing 1 or few ovules, the style short or elongate, the stigmas 1–5; fruit usually a utricle, sometimes baccate or capsular, circumscissile, irregularly dehiscent, or indehiscent.

There are few families in which characters for separating genera and species are so nearly confined to the flowers, foliage characters being usually of slight or no importance. The genera and in some cases the species can be determined only after careful and often difficult dissection of the flowers.

Ovules 2 or more. Anthers 4-celled; plants herbaceous or suffrutescent, never scandent; leaves alternate.

Fruit somewhat baccate; perianth segments more or less spreading in age.....1. *Pleuropetalum.*

Fruit dry; perianth segments erect.....2. *Celosia.*

Ovule solitary.

Leaves alternate. Anthers 4-celled.

Seeds arillate; plants often scandent and frequently more or less woody; filaments connate at the base...3. *Chamissoa.*

Seeds not arillate; plants never scandent, herbaceous; filaments distinct.....4. *Amaranthus.*

Leaves opposite.

Anthers 4-celled; segments of the sterile flowers with uncinate, spine-like tips.....5. *Cyathula.*

Anthers 2-celled; segments of the flowers never with uncinate tips.

Perianth segments united into a tube, this indurate in fruit and bearing spine-like appendages or dentate crests. 6. *Froelichia.*

Perianth segments usually distinct, never with spines or crests in age.

Stamens perigynous; flowers glomerate in the leaf axils, sessile. Plants perennial, the prostrate, much branched stems forming dense mats; plants densely lanate. 7. *Guilleminea.*

Stamens hypogynous; flowers in heads or spikes, these sessile or more often pedunculate.

Stigma capitate or sometimes shallowly bilobate.

Stamen tube 5-lobate, without pseudostaminodia, the lobes 3-lobate, dentate, or laciniate...8. *Pfaffia.*

Stamen tube 4–10-lobate, the antheriferous lobes alternating with pseudostaminodia, or the tube 5-lobate but with entire lobes...9. *Alternanthera.*

Stigma 2–3-lobate, the lobes subulate or filiform.

Stamen tube with broad lobes, these usually trilobate, dentate, or laciniate; flowers in broad, dense heads or spikes, these often subtended at the base by leaves; flowers perfect.....10. *Gomphrena.*

Stamen tube with entire, subulate lobes; flowers in slender spikes, these naked at the base; flowers often dioecious.....11. *Iresine.*

1. PLEUROPETALUM Hook. f.

Glabrous shrubs; leaves alternate, petiolate; flowers perfect, pedicellate, racemose or paniculate, greenish; perianth segments subequal, striate-nerved, obtuse, spreading in fruit; stamens 5–8, the subulate filaments connate at the base into a short cup; stigmas 2–4, short, subulate; fruit baccate, rupturing irregularly, containing few or numerous seeds.

Pleuropetalum Sprucei (Hook. f.) Standl. N. Amer. Fl. 21: 96. 1917. *Melanocarpum Sprucei* Hook. f. in B. & H. Gen. Pl. 3: 24. 1880.

A slender shrub with elongate, sometimes subscandent branches; leaves blackish when dried, short-petiolate, the blades oblong-lanceolate to ovate-elliptic, 10–18 cm. long, long-acuminate, acumi-

nate to subobtuse at the base; flowers paniculate, the panicles 3–6 cm. long, dense; sepals greenish, or becoming orange-red in fruit, 2.5–4 mm. long; fruit red or finally black, globose, 5 mm. in diameter. —Illustrated, Curtis's Bot. Mag. *pl. 6674.*

Ayacucho: Near Kimpitiriki, 400 meters, dense forest, *Killip & Smith 23002.* Ranging to southern Mexico.

2. CELOSIA L.

Annual or perennial herbs or shrubs; leaves alternate, usually petiolate; flowers perfect, in dense, terminal or axillary spikes, or fascicled along the branches; perianth 5-parted, the segments scarious; stamens 5, the filaments connate at the base into a short cup; style elongate, short, or none; stigmas 2–3, subulate or capitate; ovules 2 or more; utricle included or exserted, usually circumscissile, containing 2 to many seeds.

Sepals 3–4 mm. long, brownish when dried; leaves narrowly oblong-lanceolate.....*C. Persicaria.*

Sepals 5–9 mm. long; leaves mostly ovate.

Flower spikes about 7 mm. thick, brownish when dried; sepals 5–6 mm. long.....*C. virgata.*

Flower spikes 1.5–2 cm. thick, white, red, purple, or yellow; sepals 6–9 mm. long.....*C. argentea.*

Celosia argentea L. Sp. Pl. 205. 1753. *C. cristata* L. loc. cit.

A coarse, erect annual; leaves long-petiolate, the blades linear to rounded-ovate, acute or acuminate, often tinged with purple; flowers forming dense, thick spikes terminating the branches, variable in color from white to red, purple, or yellow; sepals 6–9 mm. long; seeds 3–8.

Loreto: Caballo-cocha, *Williams 2396.* Near Iquitos, *Williams 1349, 3535.* Pebas, *Williams 1832.* Puerto Arturo, in chácara, *Williams 5133.*—San Martín: Rumizapa, *Williams 6806.* San Roque, *Williams 7300.* Tropics of both hemispheres.

The form or variety *cristata* of this species, a form with fasciate inflorescence, is the common cockscomb ("cresta de gallo") of gardens, a favorite ornamental plant of tropical American gardens. It is probably a native of tropical America, but is not known in a wild state, although it sometimes persists or escapes from gardens. Cockscomb is cultivated for ornament in most tropical and temperate regions of the earth.

Celosia Persicaria Schinz, Bull. Herb. Boiss. II. 3: 4. 1903.

Plants herbaceous, 50 cm. high; leaves glabrous, petiolate, the blades narrowly oblong-lanceolate, about 13 cm. long and 2.5 cm. wide, acute or acuminate, long-attenuate to the base; flower spikes simple or branched, the flowers densely glomerate, the glomerules sessile, remote along the slender rachis; sepals elongate-oval, obtuse. Neg. 27888.

San Martín: Near Tarapoto, *Spruce 4929* (type).

Celosia virgata Jacq. Coll. Bot. 2: 279. 1788. *C. virgata* var. *paniculata* Suesseng. Repert. Sp. Nov. 39: 5. 1935.

Plants erect, a meter high or less, glabrous, herbaceous or suffrutescent; leaf blades broadly ovate to lanceolate or elliptic, 4–15 cm. long, acuminate or cuspidate-acuminate, at the base abruptly contracted and long-decurrent upon the petiole; spikes sessile or pedunculate, short or elongate, in terminal or axillary panicles.

Cajamarca: Jaén, *Raimondi 637*, type of var. *paniculata*. Palmal, Prov. Santa Rosa, *Raimondi 1131*. Ranging northward to the West Indies and southern Mexico.

3. CHAMISSOA HBK.

Erect or scandent herbs or shrubs; leaves alternate, petiolate, with broad blades; flowers perfect or monoecious, each subtended by usually 3 bracts, spicate, the spikes axillary or terminal, simple or paniculate; sepals 5; stamens 5, connate at the base; staminodia none; ovule 1; style short or elongate, the 2 stigmas short or elongate; utricle thin-walled, circumscissile, surrounded by the persistent calyx; seed involved in an aril, or the aril minute.

Aril minute; style elongate. Fruit subtruncate at the apex. 1. *C. Maximiliani.*

Aril well developed, involving the seed; style short.

Fruit rounded at the apex.....2. *C. macrocarpa.*

Fruit truncate and emarginate at the apex, or conspicuously areolate.....3. *C. altissima.*

Chamissoa altissima (Jacq.) HBK. Nov. Gen. & Sp. 2: 197. 1817. *Celosia paniculata* L. Sp. Pl. ed. 2. 298. 1762, not L. 1753. *Achyranthes altissima* Jacq. Enum. Pl. Carib. 17. 1760. *A. baccata* Pavón ex Moq. in DC. Prodr. 13, pt. 2: 250. 1849, in syn. *Kokera paniculata* Kuntze, Rev. Gen. 542. 1891.

Plants herbaceous or suffrutescent, stout, often much elongate and scandent, sometimes lower and suberect, glabrous or nearly so; leaves slender-petiolate, the blades oval to lanceolate, 6–18 cm. long, acute or acuminate, often rather thick; panicles naked or leafy, the spikes usually dense and thick; flowers greenish white or green, the sepals 3–4 mm. long, ovate or broadly ovate, acute or acuminate; utricle equaling or slightly exceeding the sepals; seed black, 2–2.5 mm. in diameter.

Loreto: Lower Río Nanay, *Williams 432, 489, 521, 520, 510, 504, 498.* Pebas, in forest, *Williams 1852.* La Victoria, edge of forest, in pasture, or along stream, *Williams 2670, 2666, 2650, 2523.* Caballo-cocha, in forest or cleared land, *Williams 2417, 2295.* Iquitos, *Williams 8196, 8028.*—San Martín: Lamas, 840 meters, *Williams 6486.* Pongo de Cainarachi, 230 meters, *Klug 2648.*—Without locality, *Weberbauer 6964.* Generally distributed in the lowlands of tropical America.

The plant is abundant in many regions, growing usually in clearings or thickets. In some plants all or most of the flowers are sterile, the inflorescence then being much more lax and slender than in fertile plants.

Chamissoa macrocarpa HBK. Nov. Gen. & Sp. 2: 197. 1817. *Celosia tomentosa* Willd. ex R. & S. Syst. Veg. 5: 531. 1819.

Plants low, herbaceous or suffrutescent, often scandent; leaves usually bright green when dried, slender-petiolate, the blades oblong-ovate or ovate-elliptic, 15 cm. long or less, acute or acuminate, glabrous or nearly so; panicles rather lax and open, the flowers 4 mm. long, green; sepals ovate-oblong; utricle usually surpassing the calyx, circumscissile below the middle.

Loreto: Balsapuerto, 220 meters, *Klug 2997* (determination uncertain).—San Martín: Morales, near Tarapoto, in forest, *Williams 5666.* Tarapoto, *Williams 6577.* Juanjui, 400 meters, in forest, *Klug 3859.* Ranging to Brazil and Colombia, and perhaps also to Mexico.

Chamissoa Maximiliani Mart. ex Moq. in DC. Prodr. 13, pt. 2: 251. 1849.

Plants rather slender, herbaceous or suffrutescent, erect or subscandent, usually 1 meter long or less; leaves slender-petiolate, commonly drying bright green, the blades ovate or ovate-oblong, 4–8 cm. long, acuminate, acute to rounded at the base, puberulent on the veins or almost glabrous; inflorescence usually rather lax and

open; sepals 3 mm. long, acuminate; utricle shorter than the calyx, areolate at the apex; seed black, 1.5 mm. in diameter. Neg. 7358.

Junín: Colonia Perené, 600 meters, in forest, *Killip & Smith 25163*.—San Martín: Chazuta, 260 meters, in forest, *Klug 4077*. Juanjui, 400 meters, in forest, *Klug 3782*. Paraguay to Surinam and Costa Rica.

All the Peruvian species of *Chamissoa* are almost identical in general appearance, and can be distinguished only by fruit characters. Specimens of *C. Maximiliani* usually are bright green when dried, and the inflorescence is more lax and open than is usual in *C. altissima*.

4. AMARANTHUS L.

Annuals; leaves alternate, petiolate; flowers usually green, monoecious, dioecious, or polygamous, bracteate and bibracteolate, glomerate, the glomerules axillary or disposed in spikes, the spikes often paniculate; sepals usually 5, sometimes 1–3; stamens normally 5, the subulate or filiform filaments distinct; ovary 1-ovulate; style short or wanting, the style branches 2–3; utricle usually included in the perianth, indehiscent, cirsumscissile, or bursting irregularly, 2–3-dentate at the apex.—There is considerable doubt regarding the validity of some of the forms listed here as species. The forms related to *A. hybridus* are variable, and authors are not in agreement as to their status.

Plants armed with axillary spines..... *A. spinosus.*

Plants unarmed.

Flowers all in axillary clusters..... *A. peruvianus.*

Flowers chiefly in terminal spikes.

Utricle indehiscent.

Utricle rugose..... *A. gracilis.*

Utricle smooth..... *A. deflexus.*

Utricle circumscissile.

Sepals of the pistillate flowers spatulate, contracted into a claw, urceolate in age, pinnate-nerved.... *A. Haughtii.*

Sepals of the pistillate flower oblong to obovate, not contracted into a claw or, if somewhat spatulate, not urceolate.

Seeds white or whitish..... *A. caudatus.*

Seeds black.

Bracts conspicuously longer than the sepals.

Bracts green, usually twice as long as the sepals; terminal spike commonly short and thick, erect. *A. hybridus.*

Bracts deep red or purple, less than twice as long as the sepals; terminal spike slender, much elongate, recurved..... *A. cruentus.*

Bracts not exceeding the sepals, often much shorter.

Flower spikes short, very dense, usually 1 cm. thick or more..... *A. celosioides.*

Flower spikes much elongate, slender and often interrupted, commonly 5–7 mm. thick.... *A. dubius.*

Amaranthus caudatus L. Sp. Pl. 990. 1753.

Plants coarse and erect, often 2 meters high or more, at least in cultivation, sparsely branched, glabrous, or sparsely villous about the inflorescence; leaves slender-petiolate, the blades lanceolate to rhombic-ovate, 20 cm. long or less, acute at base and apex; panicles usually very large and composed of numerous long, slender, dense spikes, these often drooping; bracts twice as long as the sepals or shorter; sepals of the pistillate flower 1.5–2 mm. long, usually spatulate, often red or purple; utricle circumscissile at the middle; seeds whitish in cultivated forms, dull, not shining and black as in most species.

Without locality: *Weberbauer 5426.* Probably native of the Old World tropics.

Called "Inca pachaqui" in Bolivia. In some parts of the Andes the plant is grown extensively for its seeds, which are boiled and eaten, or ground into meal. The plant is grown for food in central Mexico, as well as in Abyssinia and Tibet and other regions of the Old World.

Amaranthus celosioides HBK. Nov. Gen. & Sp. 2: 194. 1817.

Plants tall and stout or more often low, often much branched; leaves on long, slender petioles, the blades orbicular to broadly ovate or ovate-rhombic, 6 cm. long or less, broadly rounded to acutish at the apex; flower spikes green or sometimes sparsely tinged with red, short, thick, very dense, erect; bracts mostly shorter than the sepals; sepals 5; utricle circumscissile.

Huánuco: Mito, 2,700 meters, a dooryard weed, *1684.*—Junín: Tarma, 3,100 meters, open hillside, *Killip & Smith 21926.*—Lima:

Lima, 150 meters, roadsides, *68.*—Piura: Pariñas Valley, *Haught F179.*—Without locality, *Weberbauer 5332.* Chile to Venezuela. "Ratago." Called "bledo" in Ecuador.

Amaranthus cruentus L. Syst. Veg. ed. 10. 1269. 1759. *A. paniculatus* L. Sp. Pl. ed. 2. 1406. 1763.

Plants stout, erect, 2 meters high or less, simple or much branched, the stems usually pubescent, villous about the inflorescence; leaves long-petiolate, the blades rhombic-ovate to ovate-lanceolate, 30 cm. long or less, acute or acuminate, acute to attenuate at the base; panicles usually large, composed of numerous spikes, the terminal spike usually much elongate, slender, and recurved, deep red or purple; bracts usually half longer than the sepals; sepals of the pistillate flower 1.5 mm. long, often obtuse or rounded at the apex; utricle exceeding the sepals, circumscissile at the middle.

Loreto: Lower Río Nanay, *Williams 348.* Cultivated for ornament and escaped in tropical and temperate regions of both hemispheres; perhaps native of tropical America.

Known in Ecuador by the names "bledo colorado," "sangorache," and "ataco."

Amaranthus deflexus L. Mant. Pl. 2: 295. 1771. *Euxolus deflexus* Raf. Fl. Tell. 3: 42. 1837.

Plants much branched, glabrous or nearly so, ascending or decumbent, 60 cm. high or less; leaves slender-petiolate, the blades rhombic-ovate to lanceolate, small, narrowed to the obtuse apex, rounded to cuneate at the base; flowers green or purplish, chiefly in short, dense, stout, terminal spikes 2–8 cm. long; bracts shorter than the flowers; utricle oblong, smooth, longer than the sepals.

Arequipa: Posco, 550 meters, *Cook & Gilbert 43.* Probably native of the Old World, but adventive in the American tropics; specimens seen from Chile, Argentina, and Uruguay.

Amaranthus dubius Mart. Pl. Hort. Erlang. 197. 1814. *A. tristis* Willd. Hist. Amaranth. 21. 1790, saltem ex parte, not L. 1753.

Plants slender, erect, 1 meter high or less, often much branched, glabrous throughout or nearly so; leaves slender-petiolate, the blades ovate or rhombic-ovate, 3–12 cm. long, narrowed to the obtuse or rounded and often emarginate apex, rounded to acutish at the base, thin; spikes green or whitish, 5–25 cm. long, most of the flowers sterile; bracts scarious, mostly shorter than the sepals; utricle thin-walled, often exceeding the sepals.

Ayacucho: Aina, 750–1,000 meters, open hillside, *Killip & Smith 23110.*—Junín: La Merced, 700 meters, *Killip & Smith 24057.*—Loreto: La Victoria, edge of forest, *Williams 2893.* Recreo, in chácara, *Williams 4155.* Generally distributed in tropical America.

Amaranthus gracilis Desf. Tabl. Bot. 43. 1804. *Chenopodium caudatum* Jacq. Coll. Bot. 2: 325. 1788, not *Amaranthus caudatus* L. 1753. *Euxolus caudatus* Moq. in DC. Prodr. 13, pt. 2: 274. 1849.

Plants rather slender, usually less than 1 meter high, much branched, glabrous; leaves long-petiolate, thin, the blades ovate or ovate-rhombic, 8 cm. long or less, rounded or narrowed at the apex, with emarginate tip, rounded to broadly cuneate at the base; spikes panicled, 4–12 cm. long, 4–8 mm. thick; bracts ovate, scarious, much shorter than the flowers; sepals 3, oblong or linear-oblong, acute or obtuse, cuspidate; utricle strongly rugose, equaling or longer than the sepals.

Libertad: Salaverry, sandy slope of Morro Hill, *Johnston 3520.*—Loreto: Mishuyacu, in clearing, *Klug 297.* La Victoria, in pasture, *Williams 2731.* Iquitos, in pasture, *Williams 8188.*—Piura: Pariñas Valley, *Haught 265.* Tropics of both hemispheres. "Ataco."

Amaranthus Haughtii Standl. Field Mus. Bot. 11: 149. 1936.

Plants nearly glabrous, 20–60 cm. high; leaves on long, slender petioles, the blades lance-linear to ovate-elliptic, narrowed to the obtuse or rounded apex, long-attenuate to the base; flowers dioecious, pale green, arranged in axillary clusters and in short, dense, terminal spikes; sepals 5, the pistillate broadly obovate-spatulate, 2–2.5 mm. long, broadly rounded or subtruncate at the apex, with green nerves; utricle much shorter than the sepals, tridentate at the apex, circumscissile near the middle.

Piura: Pariñas Valley, *Haught F147* (type), *F148*, *221*, *227.* Talara, along sandy draws and on cliff talus, *Johnston 3509.*—Without locality, *Weberbauer 5960.*

Easily recognized by the dioecious flowers and spatulate pistillate sepals.

Amaranthus hybridus L. Sp. Pl. 990. 1753. *A. hypocondriacus* L. Sp. Pl. 991. 1753. *A. chlorostachys* Willd. Hist. Amaranth. 34. 1790.

Plants low or tall and coarse and as much as 2.5 meters high, usually much branched, erect, glabrous, rough-puberulent, or somewhat villous; leaves slender-petiolate, the blades lanceolate to rhombic-ovate, 3–15 cm. long, acute to rounded at the apex, some-

what pubescent or glabrous; flower spikes axillary and terminal, stout and dense, the terminal ones erect; bracts lanceolate or ovate, with spinose tips; sepals of the pistillate flower 1.5–2 mm. long, 1-nerved, usually mucronate; utricle equaling or shorter than the sepals, circumscissile at the middle, often rugose.

Cuzco: Ollantaitambo, 3,000 meters, *Cook & Gilbert 715*. Hacienda Capana, Paucartambo Valley, 3,450 meters, *Herrera 1053*. Vilcanota Valley, 2,900 meters, *Herrera 1073*. Valle Lares, *Diehl 2443*.—Lima: Matucana, 2,400 meters, grassy stream margin, *320*. San Gerónimo, along trail, 150 meters, *5915*. Tropical and temperate regions of almost the whole earth; usually a weed in cultivated or waste ground. "Tataco," "jataco."

The species is a somewhat variable one.

Amaranthus peruvianus (Schauer) Standl., comb. nov. *Mengea peruviana* Schauer, Nov. Act. Nat. Cur. 19: Suppl. 1: 406. 1843.

Plants small and prostrate, glabrous, the branches 15 cm. long or less, very leafy; leaves on rather long and somewhat margined petioles, the blades orbicular or nearly so, mostly 4–7 mm. long, broadly rounded and often emarginate at the apex, contracted or narrowed at the base, with rather conspicuous, pale margins and few nerves; flowers few in the axils, the bracts white and scarious; sepal only 1; stamen 1; utricle membranaceous, greenish, slightly longer than the sepals.

Puno: Type from Lake Titicaca, at 3,870 meters, *Meyen* (photo. seen, ex hb. Berol.). Also in Bolivia.

Easily recognized by the prostrate habit, very small leaves, and few flowers.

Amaranthus spinosus L. Sp. Pl. 991. 1753. *A. caracasanus* HBK. Nov. Gen. & Sp. 2: 195. 1817.

Plants nearly glabrous, erect or ascending, 1 meter high or less, much branched, armed with stout, fleshy spines in the leaf axils; leaves slender-petiolate, the blades rhombic-ovate to lanceolate, 12 cm. long or less, narrowed to the obtuse apex; pistillate flowers in dense, globose, axillary clusters, the staminate in long, slender, terminal, pale spikes; bracts usually shorter than the sepals, sometimes longer; sepals 5 in the pistillate flower, 1.5 mm. long, obtuse or acute; utricle about equaling the sepals, irregularly and imperfectly circumscissile.

Cuzco: Río Alto Urubamba, *Diehl 2491*.—Junín: Chanchamayo, *Isern 2365*.—Piura: Near Saucecito, *Haught 125*.—San Martín:

Tarapoto, in pasture, *Williams 5624*. San Roque, *Williams 7246*. Pongo de Cainarachi, 230 meters, *Klug 2733*. Tropical and temperate regions of both hemispheres, probably native of tropical America. "Ataco," "ataco casha."

The plant is a common weed of the lowland tropics of America, and extends far northward into the United States. In some regions the leaves and young shoots are cooked and eaten like spinach.

5. CYATHULA Lour.

Annual or perennial herbs; leaves opposite, petiolate; flowers fasciculate, each fascicle consisting of 1–2 perfect flowers and few or many sterile ones, the fascicles spicate or capitate, reflexed in age; segments of the sterile flowers finally produced into elongate bristles, these uncinate at the apex; stamens 5, the filaments united at the base, the staminodia linear or quadrate and lacerate; stigma capitate; utricle included in the perianth, indehiscent.

Cyathula achyranthoides (HBK.) Moq. in DC. Prodr. 13, pt. 2: 326. 1849. *Desmochaeta achyranthoides* HBK. Nov. Gen. & Sp. 2: 210. 1818.

A branched annual or perennial, 1 meter high or less, often geniculate and rooting at the base; leaves short-petiolate, the blades oval to rhombic-elliptic, thin, 5–15 cm. long, acuminate, cuneate at the base, strigose or glabrate; spikes 4–20 cm. long, 6–7 mm. thick, the flowers green; perfect flowers 2. Neg. 7390.

Huánuco: Pampayacu, 1,050 meters, forest clearing, *5071*.—Junín: Chanchamayo Valley, 1,200 meters, *Schunke 138, 599, 600*. La Merced, 700 meters, *Killip & Smith 23703*.—Loreto: Mishuyacu, 100 meters, *Klug 148*. Puerto Arturo, 135 meters, dense forest, *Killip & Smith 27907*. Fortaleza, Yurimaguas, *Williams 4269*. Paraíso, *Williams 3351*. Leticia, borders of forest and river banks, common, *Williams 3071*. La Victoria, *Williams 2561*. Caballo-cocha, *Williams 2032*. Iquitos, *Williams 1347*. Lower Río Nanay, *Williams 671, 543*.—San Martín: San Roque, *Williams 6955*. Tarapoto, *Williams 5712*. Bolivia and Brazil to Mexico.

The hooked bristles of the flowers adhere tenaciously to clothing and other articles, and penetrate the flesh easily and painfully.

6. FROELICHIA Moench

Annual or perennial herbs, erect or procumbent, with simple or branched stems; leaves opposite, sessile or petiolate; flowers perfect,

spicate, the spikes sessile or pedunculate; perianth 5-lobate, the lobes glabrous, the tube lanate, indurate in age and longitudinally winged or cristate, or bearing longitudinal rows of spines; stamens 5, the filaments united into an elongate tube, this 5-lobate at the apex; anthers sessile in the sinuses between the lobes; style elongate, with a capitate stigma, or the stigma sessile and penicillate; utricle indehiscent; seed 1.

Froelichia interrupta (L.) Moq. in DC. Prodr. 13, pt. 2: 421. 1849. *Gomphrena interrupta* L. Sp. Pl. 224. 1753. *F. lanata* Moench, Meth. 50. 1794. *Oplotheca tomentosa* Mart. Nov. Gen. & Sp. 2: 48. 1826. *F. tomentosa* Moq. in DC. Prodr. 13, pt. 2: 421. 1849.

Plants perennial from a thick root, or sometimes flowering the first year from seed, the stems ascending or decumbent, usually much less than 1 meter high, white-lanate or sericeous; leaves petiolate or the upper subsessile, the blades ovate-orbicular to oblong, 3–10 cm. long, obtuse or acute, sericeous or floccose-tomentose beneath; inflorescence lax and interrupted; fruiting calyx deltoid, broadly winged laterally, the thin wings entire or crenulate, the sides of the calyx tube with or without spine-like tubercles. Negs. 3199, 3196.

Arequipa: Mollendo, *Weberbauer 1491*.—Piura: Between Piura and Ñomala, 100–250 meters, *Weberbauer 5951*.—Túmbez: Southeast of Hacienda La Choza, 100–200 meters, *Weberbauer 7722*. Chile to Paraguay and northward to Texas and the West Indies.

7. GUILLEMINEA HBK.

Prostrate, much branched, densely leafy, lanate, perennial herbs, forming small mats; leaves opposite, those of a pair unequal, petiolate, the petioles connate at the base; flowers small, perfect, glomerate in the leaf axils; perianth lanate, with an obconic tube; stamens 5, perigynous, the filaments short-connate; style short, the stigma emarginate; ovule 1; utricle membranaceous, indehiscent.

Guilleminea densa (Willd.) Moq. in DC. Prodr. 13, pt. 2: 338. 1849. *Illecebrum densum* Willd. ex R. & S. Syst. Veg. 5: 517. 1819. *G. illecebroides* HBK. Nov. Gen. & Sp. 6: 42. 1823. *Achyranthes conferta* Pavón ex Moq. loc. cit. in syn. *Brayulinea densa* Small, Fl. Southeast. U. S. 394. 1903.

Stems numerous from a thick, vertical root, 25 cm. long or less, densely lanate; leaves on short, winged petioles, the blades elliptic to broadly oval, 3–15 mm. long, obtuse or acute, abruptly contracted

at the base, densely villous or lanate beneath; flowers white, the glomerules much shorter than the leaves; bracts ovate, acute, scarious; calyx 2–2.5 mm. long. Negs. 3233, 3201.

Cajamarca: Cascas, *Raimondi 7692.*—Cuzco: Valle Lares, *Diehl 2475, 2429a.* Hacienda Chancamayo, *Diehl 2478.* Valle del Apurímac, *Herrera* in 1929.—Huánuco: Huánuco, 2,100 meters, stony slopes, *3242; Ruiz & Pavón 5–69.* Huánuco and Cajatambo, *Ruiz.* —Junín: Tarma, 3,100 meters, open hillside, *Killip & Smith 21830.* Huancayo, 3,400 meters, rocky slope, *Ledig 42.*—Lima: Matucana, 2,400 meters, gravelly river trail, *185, 2924.*—Argentina and Brazil to the southwestern United States.

Ruiz records the vernacular name as "yerba de la sangre."

8. **PFAFFIA** Mart.

Herbs or shrubs, erect or scandent; leaves opposite, sessile or short-petiolate; flowers mostly perfect, bracteate and bibracteolate, capitate or spicate, the spikes or heads chiefly pedunculate, often numerous and paniculate; perianth sessile, terete, the 5 segments free, pilose or lanate; filaments united in a 5-lobed tube, the lobes fimbriate, dentate, or 3-lobate; staminodia none; style very short or wanting, the stigma capitate or bilobate; utricle indehiscent.

Flower spikes 1 cm. in diameter; leaves sericeous beneath with very long, lax, silvery hairs.....*P. holosericea.*

Flower spikes about 6 mm. in diameter; leaves never silvery-sericeous.

Spikes short, very dense; leaves linear or lanceolate.
P. stenophylla.

Spikes elongate, slender, much interrupted; leaves broad.

Panicle branches appressed-pilose with simple, straight hairs.
P. paniculata.

Panicle branches puberulent with fine, stellately branched or hispidulous, spreading hairs.....*P. grandiflora.*

Pfaffia grandiflora (Hook.) Fries, Arkiv Bot. 16, No. 12: 10. 1920. *Iresine grandiflora* Hook. Icon. Pl. 2: *pl. 102.* 1837. *Hebanthe decipiens* Hook. f. in B. & H. Gen. Pl. 3: 41. 1880. *Gossypianthus decipiens* Kuntze, Rev. Gen. 543. 1891.

A large, scandent shrub, similar to *P. paniculata;* leaves glabrate in age, when young copiously puberulent beneath with short, conic hairs, these hispidulous near the base, erect; inflorescence and flowers like those of *P. paniculata;* lateral lobes of the filaments minute or absent, the filaments in *P. paniculata* being deeply trifid.

Cuzco: Valle Lares, *Diehl 2407*. Quebrada Versalles, *Diehl 2451a*.—Junín: La Merced, 600 meters, edge of forest, *5379, 5796*.—Loreto: Yurimaguas, 135 meters, *Killip & Smith 29074*.—Puno: Sangabán (*Lechler* in 1854). Bolivia; Brazil.

The specimens from Cuzco could be referred equally well to *P. Bangii* Fries, a Bolivian species, distinguished by having the lower leaf surface covered with elongate, soft, articulate, more or less hispidulous hairs, but it is doubtful whether that is more than a casual variant of *P. grandiflora*.

P. grandiflora, if I have identified it correctly, is readily distinguishable from the widespread *P. paniculata* by its pubescence. There are supposed to be stamen differences also, but there is doubt regarding their importance or value.

Pfaffia holosericea (Moq.) Standl., comb. nov. *Gomphrena holosericea* Moq. in DC. Prodr. 13, pt. 2: 386. 1849. *Hebanthe holosericea* Mart. ex Moq. loc. cit. in syn. *G. holosericea* Moq. op. cit. 463. 1849.

Plants large and much branched, commonly trailing or more or less scandent, suffrutescent, the slender stems pilose with long, appressed or somewhat spreading hairs; leaves short-petiolate, large or small, lanceolate or linear-lanceolate, long-attenuate, obtuse or acute at the base, green and thinly pilose on the upper surface, covered beneath, at least when young, with very long, silvery hairs, in age sometimes almost glabrous; heads whitish, subglobose, short-pedunculate, in lax, open panicles; bracts short and broad, lanate; sepals linear-lanceolate, acute, 3-nerved, 4–5 mm. long, pilose at the base with long, straight, white hairs as long as the sepals.

Huánuco: La Merced, 600 meters, openly wooded slope, *5359*.—Loreto: Balsapuerto, 220 meters, in forest, *Klug 3011* (determination doubtful). Bolivia and Brazil.

Pfaffia paniculata (Spreng.) Kuntze, Rev. Gen. 543. 1891. *Iresine paniculata* Spreng. Syst. Veg. Cur. Post. 103. 1827. *Hebanthe paniculata* Mart. Nov. Gen. & Sp. 2: 43. *pl. 140, 142*. 1826. *Gomphrena paniculata* Moq. in DC. Prodr. 13, pt. 2: 385. 1849.

A large, scandent shrub, the branches appressed-pilose with simple hairs or glabrate; leaves short-petiolate, the blades firm, elliptic to ovate-oblong, acute or acuminate or sometimes obtuse, rounded to acute at the base, glabrate above, beneath rather sparsely appressed-pilose or soon glabrate; spikelets usually much interrupted and many-flowered, in large, open panicles; sepals ovate or oblong,

obtuse, 3–4 mm. long, 3-nerved, pubescent, pilose at the base with long, straight, whitish hairs.

Huánuco: Pampayacu, 1,050 meters, open, brushy hills, *5122.*—Loreto: Río Itaya, *Williams 52.* Lower Río Nanay, in thicket, *Williams 503.*—San Martín: Tarapoto, edge of pasture, *Williams 5481, 6749, 6741, 6309, 5513.* San Roque, *Williams 7367.*—Zepelacio, 1,100 meters, in forest, *Williams 3715.* Bolivia and Brazil to French Guiana and Ecuador.

Pfaffia stenophylla (Spreng.) Stuchl. Repert. Sp. Nov. 12: 357. 1913. *Gomphrena stenophylla* Spreng. Syst. Veg. 1: 823. 1825. *P. glauca* Spreng. Cur. Post. 107. 1827. *Serturnera glauca* Mart. Nov. Gen. & Sp. 2: 37. *pl. 136.* 1826. *G. glauca* Moq. in DC. Prodr. 13, pt. 2: 384. 1849.

Plants chiefly herbaceous, branched, slender, the older branches glabrate, the young ones sparsely appressed-pilose; leaves short-petiolate, green when dried, densely appressed-pilose when young but often almost glabrous in age; flower heads whitish, globose or in age oblong; bracts very short; sepals glabrous, obtuse, 2 mm. long, conspicuously 3-nerved. Neg. 7377.

Loreto: Iquitos, *Williams 7942, 3553, 1507, 8132.* Mishuyacu, in clearing, *Klug 1237.* Argentina and Bolivia to the Guianas. "Trompetero."

Some of Williams' specimens are taken from garden plants, although there is no apparent reason why so inconspicuous a plant should be in cultivation.

9. ALTERNANTHERA Forsk.

Herbs or shrubs, often scandent; leaves opposite; flowers perfect, bracteate and bibracteolate, capitate or spicate, usually compressed, the heads axillary or terminal; sepals distinct, unequal; filaments united to form a short or elongate tube, this with 3–5 antheriferous lobes and as many short or elongate staminodia; ovary 1-ovulate; style short or elongate; stigma capitate.

Flower heads sessile, all or chiefly axillary, never paniculate.

Staminodia shorter than the filaments; pubescence of simple or merely scaberulous hairs; sepals with greatly elongate, spine-like tips; flower heads mostly 7–10 mm. thick.

Sepals 3–5 mm. long, densely villous; leaf blades longer than broad.....*A. repens.*

Sepals 6–7 mm. long, sparsely villous or glabrate above; leaf blades usually as broad as long ..... *A. pungens.*

Staminodia equaling or much longer than the filaments; pubescence of stellate or hispidulous hairs; sepals with short, spinose tips or merely acute; flower heads mostly smaller.

Outer bracts laciniate-lobed; leaves often colored with red or purple ..... *A. Bettzickiana.*

Outer bracts entire, like the others.

Leaves glabrate, usually acute ..... *A. ficoidea.*

Leaves densely stellate-tomentose, usually rounded at the apex.

Flower heads globose ..... *A. halimifolia.*

Flower heads oblong or often much elongate. *A. peruviana.*

Flower heads pedunculate, or sometimes sessile but then terminal, often in large panicles.

Flowers conspicuously stipitate within the bractlets, the stipe 5-sulcate.

Bractlets equaling or longer than the sepals, broadly cristate toward the apex ..... *A. dentata.*

Bractlets much shorter than the sepals, narrowly cristate or ecristate.

Stems densely and minutely stellate-tomentose .. *A. flavida.*

Stems pilose, villous, or glabrate.

Stems pilose with very long, tawny, spreading hairs. *A. villosa.*

Stems pilose with short and spreading or appressed hairs.

Lower leaves mostly rounded or very obtuse at the apex; stems densely villous-tomentose with spreading hairs ..... *A. tomentosa.*

Lower leaves chiefly long-acuminate; stems usually glabrate or appressed-pilose ..... *A. brasiliana.*

Flowers sessile within the bractlets.

Peduncles simple, bearing a single head.

Plants dwarf and matted, the stems rarely more than 5 cm. long ..... *A. lupulina.*

Plants large, with much elongate stems.

Sepals pilose ..... *A. Lehmannii.*

Sepals glabrous.

Flower heads pink to purple or blackish; bractlets usually pubescent over nearly the whole surface.

A. elongata.

Flower heads usually white; bractlets glabrous or pilose only on the costa.

Heads 11–14 mm. broad; leaves glabrous or nearly so.

A. philoxeroides.

Heads usually smaller; leaves copiously pilose.

Bracts glabrous.....*A. lanceolata.*

Bracts pilose on the costa.....*A. microcephala.*

Peduncles trifid, or bearing a cluster of 2–3 heads, some of the peduncles on the plant, especially the lower ones, frequently with a single head.

Sepals pilose.

Sepals 2.5–3 mm. long.....*A. porrigens.*

Sepals 5–8 mm. long.....*A. pubiflora.*

Sepals glabrous, or rarely inconspicuously pilose at the base.

Stems and leaves densely stellate-tomentose..*A. calcicola.*

Stems and leaves not stellate-tomentose.

Clusters of heads naked at the base. Sepals 3–4 mm. long.....*A. paniculata.*

Clusters of heads, some or all of them, subtended at the base by leaves.

Heads 1 cm. broad or larger; plants large and subscandent.....*A. piurensis.*

Heads much less than 1 cm. broad; plants small.

Bracts at the base of the head with a conspicuous red blotch; heads all sessile.....*A. Macbridei.*

Bracts green; heads partly pedunculate.

A. Dominii.

Alternanthera Bettzickiana (Regel) Standl. Field Mus. Bot. 3: 254. 1930. *Telanthera Bettzickiana* Regel, Gartenflora 11: 178. 1862. *Achyranthes picta* Pass. Giardini 9: 515. 1863. *Alternanthera spathulata* Lem. Ill. Hort. 12: *pl. 445*. 1865. *Telanthera picta* C. Koch, Wochenschr. Gärtn. 9: 15. 1866.

Plants erect or ascending, annual or perennial, 40 cm. high or less, branched, the stems villous when young but soon glabrate; petioles

slender, equaling or shorter than the blades; leaf blades rhombic or rhombic-obovate, sometimes spatulate, 1–3.5 cm. long or somewhat larger, acuminate or abruptly acute and apiculate, abruptly long-attenuate to the base, undulate or crispate, sparsely appressed-pilose when young but soon glabrate, green or often colored with purple or yellowish, often variegated; heads axillary, sessile, usually solitary, ovoid or oblong, whitish; bracts and bractlets broadly ovate, aristate-acuminate, at least the lowest ones laciniately lobed, glabrous; sepals lance-oblong, acute or acuminate, 3-nerved, sparsely pilose; staminodia equaling the filaments, ligulate, laciniate at the apex.

Loreto: Pro, on the Amazon, in forest, *Williams 1975*. Lower Río Nanay, in forest, *Williams 666*. Pebas, in forest, *Williams 1922*. Yurimaguas, *Williams 4056*. Iquitos, *Williams 3574*. Brazil to the Guianas; often escaped from cultivation elsewhere in tropical America. "Paloma chaqui."

The plant often is grown for ornament in northern gardens. Probably it is a cultivated derivative of *Alternanthera ficoidea*, and it is rather doubtful whether it is known anywhere in a truly wild state.

Alternanthera brasiliana (L.) Kuntze, Rev. Gen. 537. 1891. *Gomphrena brasiliana* L. Cent. Pl. 2: 13. 1756. *Gomphrena brasiliensis* Lam. Encyl. 1: 119. 1783. *Achyranthes capituliflora* Bert. in Colla, Hort. Ripul. 4. *pl. 18*. 1824. *Mogiphanes straminea* Mart. Nov. Gen. & Sp. 2: 35. 1826. *M. ramosissima* Mart. op. cit. 36. 1826. *Telanthera capituliflora* Moq. in DC. Prodr. 13, pt. 2: 381. 1849. *Achyranthes geniculata* Pavón ex Moq. loc. cit. in syn. *T. ramosissima* Moq. loc. cit. *T. brasiliana* Moq. op. cit. 382. 1849.

Plants usually large and much branched, herbaceous or suffrutescent, often scandent, the branches slender or stout, pilose with rather long and appressed or sometimes short and somewhat spreading hairs, often glabrate or almost glabrous from the first; leaves slender-petiolate, the blades oblong or lanceolate to ovate, 4–10 cm. long or even larger, acute or acuminate, rounded to acute at the base, appressed-pilose or sericeous, often nearly glabrous; flower spikes globose or short-oblong, 1–2.5 cm. long, 8–12 mm. thick, stramineous or whitish; peduncles simple or trifid; bracts and bractlets half as long as the sepals or shorter, glabrous or nearly so, sometimes narrowly and obscurely cristate near the apex, the crest denticulate; sepals ovate-lanceolate or lance-oblong, 3–5 mm. long, rigid, acute, short-pilose; staminodia longer than the filaments, ligulate, laciniate at the apex.

Cuzco: Quebrada Versalles, *Diehl 2450.* Machupicchu, *Soukup 188.*—Huánuco: Cueva Grande, 1,050 meters, dense thicket, *4796.* Muña, 2,100 meters, edge of thicket, *3960.*—Huánuco: Pillao, *Ruiz & Pavón 5–61.*—Junín: La Merced, 600 meters, stream bed, *5238;* in thicket, *Killip & Smith 23381.* Colonia Perené, 680 meters, open, rocky bank, *Killip & Smith 24985.*—San Martín: Río Mayo, *Williams 6194.* Tarapoto, edge of forest and along river, *Williams 5691, 5445.* Brazil to southern Mexico and the West Indies.

The species is a somewhat variable one, but the Peruvian material is fairly uniform. Moquin lists *Poeppig 152* from Peru as *Telanthera Moquini* Webb, and I presume that the plant is *Alternanthera brasiliana.*

Alternanthera calcicola Standl. Field Mus. Bot. 11: 151. 1936.

Perennial, erect or procumbent, the branches densely stellate-tomentose; leaves subsessile or short-petiolate, lance-oblong to rounded-oval, 8–22 mm. long, obtuse or rounded at the apex, densely stellate-tomentose; flower heads few, triglomerate, terminal or a few axillary, chiefly in a small, dense, almost head-like inflorescence, stramineous or whitish; bracts almost equaling the calyx, glabrous; sepals 2.5 mm. long, glabrous, acutish or obtuse.

Junín: La Oroya, 3,600 meters, limestone cliff ledges, *944.* Huariaca, 2,850 meters, shrubby canyon side, *3110.*

Well marked by the dense, whitish, stellate tomentum.

Alternanthera dentata (Moench) Stuchl. ex Fries, Arkiv Bot. 16, No. 13: 11. 1921. *Gomphrena brasiliensis* Jacq. Coll. Bot. 2: 278. 1788, non L. 1756. *G. dentata* Moench, Meth. Suppl. 273. 1802. *Mogiphanes brasiliensis* Mart. Nov. Gen. & Sp. 2: 34. 1826. *M. Jacquini* Schrad. Ind. Sem. Goetting. 1834: 4. 1834. *Telanthera dentata* Moq. in DC. Prodr. 13, pt. 2: 378. 1849, ex parte. *Alternanthera brasiliana* var. *Jacquini* Kuntze, Rev. Gen. 2: 538. 1891. *Achyranthes Jacquini* Standl. Journ. Wash. Acad. Sci. 5: 74. 1915. *?A. Moquini* var. *grandiceps* Suesseng. Repert. Sp. Nov. 35: 302. 1934.

Plants perennial, erect or ascending, sometimes subscandent, herbaceous or suffrutescent, usually much branched, the stems appressed-pilose or glabrate; leaves slender-petiolate, the blades oval or ovate to oblong, mostly 4–10 cm. long, acute or acuminate, abruptly acute at the base, thin, sparsely or densely appressed-pilose or sericeous, sometimes glabrate; peduncles simple or trifid, elongate; flower heads globose or short-cylindric, 1–2.5 cm. long, about 1 cm. in diameter; bracts short, white, long-acuminate, gla-

brous; bractlets equaling or longer than the sepals, oblong, acute, sparsely villous, cristate dorsally, the crest serrulate; sepals lance-oblong, rigid, 3-nerved, acute, appressed-pilose, 3–3.5 mm. long; staminodia longer than the filaments, ligulate, lacerate at the apex.

Loreto: Yurimaguas, in chácara, *Williams 3916; Killip & Smith 27584.* Mishuyacu, 100 meters, in clearing, *Killip & Smith 29918; Klug 1511.*—Piura: Caña Dulce, 20 miles inland from Negritos, along watercourse, *Haught F31.*—Túmbez: Plain southeast of Hacienda La Choza, 100–200 meters, *Weberbauer 7696.* Brazil to the West Indies.

The leaves are sometimes pink or deep purple. Killip and Smith report that they are used for coloring pottery. The type of *A. Moquini* var. *grandiceps* is *Weberbauer 6366* from Piura.

Alternanthera Dominii Schinz, Pflanzenfam. ed. 2. 16c: 76. 1934. *Telanthera nana* Moq. in DC. Prodr. 13, pt. 2: 374. 1849, not *A. nana* R. Br. 1810.

A slender annual, erect or decumbent, simple or branched, 30 cm. high or less, the stems glabrous or nearly so; leaves on rather slender petioles, the blades thin, broadly rhombic-ovate to ovate or obovate, 2 cm. long or less, obtuse, contracted and decurrent at the base, sparsely pilose above, usually glabrous beneath; heads white, globose, 4–5 mm. in diameter, chiefly terminal, often in twos, one sessile, the other pedunculate and composed of 2–3 sessile heads, the clusters subtended by 2 slightly reduced leaves; bracts ovate, mucronate, glabrous, half as long as the calyx; sepals 1.5 mm. long, ovate-oblong, obscurely serrulate near the apex, obscurely 3-nerved, glabrous or pubescent at the base; staminodia equaling the filaments, laciniate at the apex.

Lima: Matucana, 2,400 meters, among rocks on moist, grassy slope, *106.* Type of *T. nana* from Peru, without locality, *Mathews 779.*

It is not at all certain that the collection cited is the same as the plant described as *Telanthera nana.*

Alternanthera elongata (Willd.) Schinz, Nat. Pflanzenfam. ed. 2. 16c: 75. 1934. *Gomphrena elongata* Willd. ex R. & S. Syst. Veg. 5: 542. 1819. *Brandesia elongata* Mart. Beitr. Amarant. 105. 1826. *Telanthera elongata* Moq. in DC. Prodr. 13, pt. 2: 372. 1849.

Plants large and much branched, usually trailing or scandent, slender, pilose with appressed or spreading hairs; leaves mostly

short-petiolate, the blades ovate to lance-oblong, acute or acuminate, pilose with appressed or spreading hairs, often densely sericeous-pilose beneath; peduncles axillary and terminal, short or elongate, simple or trifid; heads subglobose or oblong, about 7 mm. broad, rarely more than 1 cm. long, pink or purple, sometimes fuscous when dried; bractlets ovate, acuminate and short-mucronate, a third as long as the calyx, usually densely pubescent; sepals 2.5–3 mm. long, oblong, acutish or obtuse, glabrous, obscurely 3-nerved; staminodia longer than the filaments, laciniate at the apex. Negs. 3231, 7387.

Amazonas: Chachapoyas, 2,700 meters, *Williams 7535.*—Huánuco: San Rafael, 2,550 meters, river canyon slopes, *3140.* Northward to Colombia.

Alternanthera elongata var. **nigriceps** (Hook.) Suesseng. Repert. Sp. Nov. 35: 299. 1934. *A. nigriceps* Hook. Bot. Misc. 2: 237. 1831. *A. nigripes* Steud. Nom. Bot. ed. 2. 1: 65. 1840. *Telanthera elongata* var. *nigriceps* Moq. in DC. Prodr. 13, pt. 2: 372. 1849. "*Alternanthera nigrescens* Hook." ex Moq. loc. cit. in syn. *Achyranthes atra* Pavón ex Moq. loc. cit. in syn.

Like the species, except that the flowers in age become black or purple-black; heads sometimes 8–9 mm. in diameter. Neg. 7386.

Huánuco: Llata, 2,100 meters, grassy ledges of river cliffs, 2,100 meters, *2231.*—Junín: Yanahuanca, 3,000 meters, rocky slopes, *1247.* Tarma, 3,100 meters, open hillside, *Killip & Smith 21936.* Between Viques and Ingahuasi, 3,150 meters, open hillside, *Killip & Smith 22169.*—Lima: Type from Obrajillo. San Buenaventura, 2,700 meters, open, rocky slopes, *Pennell 14511.* Matucana, 2,400 meters, stony slope, *117.* Canta, 2,800 meters, open, rocky slope, *Pennell 14348.* Canta and Obrajillo, *Ruiz & Pavón.*

The variety, a well marked color form, but probably only a slight variation from the type, is known only from Peru. The heads often are somewhat larger than in the typical form of *A. elongata,* but not always so. Suessenguth has described (Repert. Sp. Nov. 35: 299. 1934) two forms of this variety which have but scant systematic interest: f. *major* (*Pennell 14511* from San Buenaventura), and *f. minor* (*Raimondi 1528* from Dept. Ancash, and *Weberbauer 3037,* collected between Samanco and Caraz).

Alternanthera ficoidea (L.) R. Br. Prodr. 417. 1810. *Gomphrena ficoidea* L. Sp. Pl. 255. 1753. *Achyranthes ficoidea* Lam. Encycl. 1: 548. 1785. *Bucholzia ficoidea* Mart. Nov. Gen. & Sp. 2: 51. 1826. *Telanthera ficoidea* Moq. in DC. Prodr. 13, pt. 2: 363. 1849.

Perennial, prostrate or ascending, herbaceous, the branches at first pubescent with short, appressed, branched or hispidulous, white hairs; leaves petiolate, the blades elliptic to oblong, 2.5–5.5 cm. long, acute or rarely obtuse, when young finely pubescent with short, hispidulous hairs; heads axillary, solitary or glomerate, sessile, about as broad as long, white or yellowish; bracts and bractlets half as long as the sepals, broadly ovate, acuminate to a rigid, spinose tip, usually sparsely pilose; sepals lance-oblong to ovate, 3–3.5 mm. long, acuminate, mucronate, 3-nerved, short-pilose; staminodia ligulate, equaling or shorter than the filaments, laciniate at the apex; utricle suborbicular.

Lima: Callao, *Wilkes Exped.*—Loreto: Iquitos, in pasture, *Williams 3593;* waste places, *Killip & Smith 27498.* Mishuyacu, in clearing, *Klug 1209, 1049.*—Piura: Between Piura and Ñomala, 100–250 meters, *Weberbauer 5957.* General through tropical America.

Alternanthera flavida Suesseng. Repert. Sp. Nov. 35: 300. 1934. *A. asterophora* Standl. Field Mus. Bot. 11: 150. 1936.

A shrub 2 meters high, the branches densely stellate-tomentose; leaves on rather long petioles, the blades 3–6.5 cm. long, rounded-ovate to broadly elliptic, rounded to acutish at the apex, acute to truncate at the base, tomentose on both surfaces, more densely so beneath, with closely appressed, yellowish, stellate or hispidulous hairs; heads stramineous, 12–15 mm. wide, globose or short-oblong, paniculate, the peduncles trifid; bracts broadly ovate, short, obtuse or acute, pilose; sepals pilose, at least below, 5–6 mm. long, obtuse.

Huancavelica: Valley of Río Mantaro below Colcabamba, 1,700 meters, *Weberbauer 6464,* type (also type of *A. asterophora*).

Alternanthera halimifolia (Lam.) Standl. ex Pittier, Pl. Usual. Venez. 145. 1926. *Achyranthes halimifolia* Lam. Encycl. 1: 547. 1785. *Illecebrum frutescens* L'Hér. Stirp. Nov. 75. 1788. *I. alsinaefolium* Scop. Delic. Insub. 3: 27. 1788. *I. limense* Dum. Cours. Bot. Cult. 1: 646. 1802. *Alternanthera truxillensis* HBK. Nov. Gen. & Sp. 2: 206. 1817. *Telanthera frutescens* Moq. in DC. Prodr. 13, pt. 2: 365. 1849. *Celosia peruviana* Van Spand. ex Moq. loc. cit. in syn. *Achyranthes incana* Moq. loc. cit. in syn. *T. frutescens* var. *acutifolia* Moq. op. cit. 366. 1849. *T. frutescens* var. *manillensis* Moq. loc. cit. *T. densiflora* Moq. op. cit. 366. 1849. *T. truxillensis* Moq. op. cit. 367. 1849. *Alternanthera ficoidea* var. *halimifolia* Kuntze, Rev. Gen. 2: 539. 1891. *T. halimifolia* A. Stewart, Proc. Calif. Acad. IV. 1: 58. 1911.

A much branched perennial, prostrate or procumbent, the stems stellate-puberulent and with spreading, hispidulous hairs, in age sometimes glabrate; leaves rather thin, short-petiolate, the blades oblong to oval or obovate-oblong, 1.5–6 cm. long or larger, rounded to acutish at the apex, when young densely stellate-pubescent and often pilose with spreading, hispidulous hairs, in age sometimes glabrate; heads chiefly axillary, whitish, sessile, globose, solitary or glomerate, the flowers stramineous or whitish; bracts and bractlets half as long as the sepals, ovate, acuminate, mucronate, appressed-pilose, the tips not appressed; sepals 3–4 mm. long, ovate-oblong, acute, 3–5-nerved, densely pubescent with short, hispidulous hairs; staminodia ligulate, longer than the filaments, ligulate at the apex. Neg. 3230.

Huánuco: Huánuco, 2,100 meters, in hedge, *2319, 3540; Ruiz & Pavón 5–66.*—Libertad: Trujillo, *Humboldt & Bonpland,* type of *A. truxillensis* (photo. ex hb. Berol.). Salaverry, sandy slopes, *Johnston* 3521.—Lima: Type of *Achyranthes halimifolia* from Lima. Río Chillón, near Viscas, 1,900 meters, open, rocky slopes, *Pennell 14456.* Lima, Huánuco, and Chancai, *Ruiz & Pavón 5–66.* Lurín, moist, open soil, *Pennell 12210.* Lima, *Cook & Gilbert 2070.* Chosica, 900 meters, dry gulch, *2864.* San Lorenzo Island, *Andersson.* Callao, slopes of seaside gulches, *5882; Wilkes Exped.* Obrajillo, *Wilkes Exped.* Santa Clara, *Rose 18567, 18775.*—Piura: Serrán, 250 meters, *Weberbauer 5977.* Talara, *Haught 54.* Ten miles east of Talara, abundant on low hills near the sea, *Haught F99.* Paita, *Rose 18512;* shale cliff above the sea, *Pennell 14817.* Chile, Ecuador, Jamaica, and probably elsewhere. "Yerba blanca," "sanguinaria."

The plants are somewhat variable, and the species is too closely related to *A. ficoidea,* there being no sharp differences between the two. In some plants the leaves are very densely and finely silvery-pubescent, even in age, while in others the leaves are soon green and glabrate.

Alternanthera lanceolata (Benth.) Schinz, Nat. Pflanzenfam. ed. 2. 16c: 75. 1934. *Brandesia lanceolata* Benth. Pl. Hartweg. 247. 1839. *Telanthera lanceolata* Moq. in DC. Prodr. 13, pt. 2: 371. 1849. *Mogiphanes soratensis* Rusby, Bull. N. Y. Bot. Gard. 6: 503. 1910. *A. mexicana* var. *gracilis* Suesseng. Repert. Sp. Nov. 35: 301. 1934.

Plants annual or perennial, slender, erect or more often procumbent and rooting at the nodes, or elongate and straggling, much branched, the stems pilose with rather long, pale, appressed or spreading hairs, often glabrate in age; leaves slender-petiolate, the

petioles short or elongate, the blades usually thin, narrowly lanceolate to lance-ovate, oblong-elliptic, or even somewhat obovate, acute or often long-acuminate, usually attenuate at the base, pilose with long, appressed or spreading, weak hairs, rarely glabrate; peduncles slender, densely pilose, axillary or terminal, usually simple, rarely trifid; heads short-oblong, whitish or greenish white, 6–8 mm. wide, rarely more than 1 cm. long; bractlets glabrous, much shorter than the flowers (or in bud sometimes projecting beyond them), abruptly contracted into a long, stiff, spine-like mucro, this often recurved; sepals glabrous, rigid, 2.5–3 mm. long, acute, obscurely 3-nerved; staminodia longer than the filaments, 4–6-fid.

Ayacucho: Carrapa, 1,500 meters, dense forest, *Killip & Smith 22351*.—Cuzco: Quillabamba, *Soukup 187*. Río Yanamayo, 2,300 meters, bank in forest near stream, *Pennell 14037*.—Huánuco: Muña, 2,100 meters, *3996* (type of *A. mexicana* var. *gracilis*), *4013*. Cani, 2,550 meters, in clearing, *3441*.—Libertad: Cushi, 1,500 meters, *4820*. Bolivia to Colombia and Venezuela.

Alternanthera Lehmannii Hieron. Bot. Jahrb. 20: Beibl. 49: 8. 1895. *Achyranthes Lehmannii* Standl. Journ. Wash. Acad. Sci. 5: 74. 1915.

Plants slender, much branched, probably supported on other plants, weak, the stems pilose with rather long, chiefly spreading hairs; petioles slender, short or elongate; leaf blades lance-oblong to oblong-elliptic, thin, abruptly acuminate or rarely obtuse, acute or attenuate at the base, copiously pilose with usually widely spreading hairs; peduncles chiefly axillary, long and slender, simple; heads white or stramineous, globose or short-oblong, 1 cm. long or less; bractlets whitish, ovate, very long-aristate, shorter than the sepals, glabrous; sepals 2.5–3 mm. long, oblong, acute, obscurely 3-nerved, copiously short-pilose; staminodia longer than the filaments, laciniate-dentate at the apex. Neg. 3219.

San Martín: San Roque, in forest, *Williams 7403*. Ranging to Colombia. "Picurullum-sisa."

The determination of the single Peruvian collection is somewhat doubtful. *A. Lehmannii* probably is only a variety of *A. lanceolata*. By Suessenguth it is reduced, apparently, to synonymy under *A. mexicana* (Moq.) Hieron.

Alternanthera lupulina HBK. Nov. Gen. & Sp. 2: 206. 1817. *Bucholzia lupulina* Mart. Beitr. Amarant. 108. 1825. *Illecebrum*

lupulinum Spreng. Syst. Veg. 1: 820. 1825. *Telanthera andicola* Moq. in DC. Prodr. 13, pt. 2: 373. 1849. *Achyranthes parviflora* Pavón ex Moq. loc. cit. in syn. *T. lupulina* Moq. op. cit. 374. 1849, excluding description. *Achyranthes lupulina* Willd. ex Moq. loc. cit. in syn.

Plants perennial, densely branched, the stems glabrate, suffrutescent, forming dense mats 10 cm. broad, densely leafy; leaves petiolate, spatulate, obtuse, glabrous, 5 mm. long or less; heads small, white, naked, on short, slender, glabrate, terminal peduncles slightly surpassing the leaves, subglobose; bracts about equaling the calyx, ovate, acutish, glabrous; sepals 2.5 mm. long, lance-oblong, obtuse, glabrous, scarious, obscurely 3-nerved; staminodia equaling the filaments, slightly dilated at the apex and laciniate-dentate. Negs. 7385, 3221.

Ancash: Mountains near Conchucos, 4,500 meters, *Weberbauer 7246*.—Cajamarca: Near Cajamarca, *Humboldt & Bonpland*, type (photo. seen ex hb. Berol.).—Junín: Morococha, 4,500 meters, steep, short grass slope, *880*. La Oroya, 3,300–3,900 meters, *Kalenborn 14*.—Without definite locality: Andes, *Ruiz & Pavón*. High Andes of Peru, *Wilkes Exped.* Moquin reports specimens collected by Pavón, MacLean, and Mathews.

The species is a high alpine plant, growing at a higher elevation than any other Andean species. It is different from other Peruvian species in its small size and dense, cespitose habit. The plant Moquin described as *Telanthera lupulina* is *Alternanthera Macbridei*.

Alternanthera Macbridei Standl. Field Mus. Bot. 11: 151. 1936. *Telanthera lupulina* Moq. in DC. Prodr. 13, pt. 2: 374. 1849, as to description and as to synonymy in part, not *A. lupulina* HBK. *Achyranthes lactea* Moq. loc. cit. in syn.

Plants perennial from a thick root, the stems 60 cm. long or less, simple or much branched from the base, erect or decumbent, sparsely pilose or glabrate; leaves short-petiolate, the blades small, oblong-spatulate to elliptic or obovate, acute or obtuse, sparsely pilose or glabrate; flower heads white, globose or short-oblong, very obtuse, sessile in clusters of 3 at the ends of the branches, each cluster subtended by 2 leaves, these with a conspicuous central red blotch; bracts and bractlets shorter than the sepals, acute and aristate-mucronate, glabrous; sepals linear-oblong, acute or obtuse, 3 mm. long, glabrous; staminodia longer than the filaments, ligulate, slightly dilated and subtrifid at the apex. Neg. 3218.

Huánuco: Chinchao, *Ruiz & Pavón* (photo. ex hb. Berol). Cheuchín, *Ruiz & Pavón*.—Junín: La Oroya, 3,600 meters, base of limestone cliff, *967*, type; *Rose 18704; Kalenborn 121*. La Quinua, 3,600 meters, steep, grassy slope, *2027*. Near Huancayo, 3,400 meters, open, rocky hillside, *Killip & Smith 23355*.—Lima: Río Blanco, 3,000–3,500 meters, open hillside, *Killip & Smith 21708*.—Cuzco: Cuzco, *Soukup 200*.

A well marked species, easily recognized by the red-blotched leaves subtending the cluster of flower heads.

Alternanthera microcephala (Moq.) Schinz, Nat. Pflanzenfam. ed. 2. 16c: 75. 1936. *Brandesia mexicana* Schlecht. Linnaea 7: 392. 1832. *Telanthera microcephala* Moq. in DC. Prodr. 13, pt. 2: 371. 1849. *T. mexicana* Moq. op. cit. 372. 1849. *A. mexicana* Hieron. Bot. Jahrb. 20: Beibl. 49: 8. 1895, non Moq. 1849.

Plants herbaceous, erect or ascending, often reclining, much branched, weak, slender, the stems pilose with long, white, chiefly spreading or sometimes retrorse hairs; petioles short or elongate, the blades thin, lance-oblong to oval-ovate, 3–10 cm. long, rather abruptly long-acuminate, obtuse to long-attenuate at the base, pilose on both surfaces; peduncles chiefly axillary and simple, elongate, very slender; spikes subglobose or short-cylindric, 5–7 mm. thick, about 1 cm. long, white; bractlets broadly ovate, half as long as the calyx, long-aristate, villous on the costa; sepals narrowly oblong, 2.5–3.5 mm. long, acute or acutish, 3-nerved, glabrous; staminodia longer than the anthers, ligulate, laciniate at the apex.

Ayacucho: Aina, 750–1,000 meters, in thicket, *Killip & Smith 22792*.—Cuzco: San Miguel, Urubamba Valley, 1,800 meters, *Cook & Gilbert 904*.—Huánuco: Mito, 2,700 meters, shady thicket, *3274*.—Junín: Eneñas, 1,600–1,900 meters, dense forest, *Killip & Smith 25741*. Carpapata, 2,700–3,200 meters, edge of forest, *Killip & Smith 24440*. Bolivia to Colombia and Mexico.

It is doubtful whether this is more than a form of *Alternanthera lanceolata*.

Alternanthera paniculata HBK. Nov. Gen. & Sp. 2: 208. 1817. *Illecebrum paniculatum* Spreng. Syst. Veg. 1: 819. 1825. *Telanthera paniculata* Moq. in DC. Prodr. 13, pt. 2: 377. 1849. *T. luzuloides* Moq. op. cit. 378. 1849. *T. Meyeriana* Regel & Koern. Ind. Sem. Hort. Petrop. 24. 1856. *T. Bangii* Rusby, Mem. Torrey Club 6: 110. 1896. *Mogiphanes paniculata* Rusby, Bull. N. Y. Bot.

Gard. 6: 503. 1910. *Achyranthes Bangii* Standl. Journ. Wash. Acad. Sci. 5: 74. 1915.

Plants large and much branched, suberect or more often scandent, sometimes 3 meters long or more, the slender branches usually softly pilose with short or long, spreading hairs, sometimes appressed-pilose; leaves slender-petiolate, green, rather thin, ovate to elliptic or lance-oblong, acute or acuminate, acute or obtuse at the base, usually densely appressed-pilose, especially beneath, rarely somewhat glabrate; flower heads white or pink to purple, naked at the base, forming large, open panicles, usually sessile in clusters of 3, sometimes solitary and long-pedunculate, the clusters long-pedunculate, the heads globose or short-oblong; bracts and bractlets much shorter than the calyx, lanceolate or ovate, glabrous or pubescent, mucronate; sepals 3–4 mm. long, glabrous, linear-oblong, acute, 3-nerved; staminodia longer than the filaments, laciniate at the apex. Negs. 3222, 3224.

Huánuco: Yanano, 1,800 meters, in thicket, *3733*, *4934*. Mito, 2,700 meters, sprawling on stone wall, *1536*.—Lima: Matucana, 2,400 meters, among rocks on steep canyon slope, *260*. Río Chillón above Obrajillo, 3,300 meters, on rocks about cascade, *Pennell 14700*. Río Blanco, 3,000–3,500 meters, open hillside, *Killip & Smith 21658*. Bolivia to Colombia.

The Peruvian material referred here varies conspicuously in the size of the flowers, and it is altogether possible that it includes two species. The flowers usually are white, but occasionally pink or purplish.

Alternanthera peruviana (Moq.) Suesseng. Repert. Sp. Nov. 35: 302. 1934. *Telanthera peruviana* Moq. op. cit. 366. 1849. *A. peruviana* f. *globifera* Suesseng. op. cit. 303.

Plants perennial, much branched, procumbent or prostrate, the branches often elongate, densely silvery-strigose; leaves sessile or short-petiolate, thick, oblong to obovate, mostly 1.5–4.5 cm. long, rounded to acutish at the apex, narrowed to the base, when young densely strigose or silvery-sericeous on both surfaces, in age glabrate or the pubescence more often persistent; flower heads axillary, sessile, solitary or glomerate, short-oblong or sometimes as much as 2.5 cm. long, whitish or stramineous; bracts ovate, acutish, short-villous, the tips appressed or even incurved; sepals somewhat indurate, ovate to oblong, acute, the outer sometimes glabrous, the inner short-villous; staminodia equaling the filaments, ligulate, laciniate at the apex.

Type of *Telanthera peruviana* collected somewhere in Peru, *Cuming 971.*—Piura: Talara, common on sandhills and sandy ground, forming tangled masses of branches, *Haught 32;* open, arid cliff, *Pennell 12203.*—Túmbez: Between Zorritos and Cancas, sandy seashore plain, *Weberbauer 7749.* Also in Ecuador.

The type of f. *globifera* was collected at Paita by Ball.

Alternanthera philoxeroides (Mart.) Griseb. Abh. Ges. Wiss. Goett. 24: 36. 1879. *Bucholzia philoxeroides* Mart. Nov. Act. Acad. Leop. Carol. 13, pt. 1: 315. 1826. *Telanthera philoxeroides* Moq. in DC. Prodr. 13, pt. 2: 362. 1849. *Achyranthes philoxeroides* Standl. Journ. Wash. Acad. Sci. 5: 74. 1915.

A herbaceous perennial, the stout stems often fistulous, ascending or decumbent, simple or branched, 1 meter long or less, villous in the leaf axils, elsewhere glabrous or sparsely villous; leaves short-petiolate or subsessile, elliptic-linear to obovate, 4–12 cm. long, acute or obtuse, rather thick, glabrous; peduncles simple, axillary or terminal, 1–5 cm. long; flower spikes globose, 14–17 mm. thick, white; bracts one-fourth as long as the sepals, acute or acuminate, glabrous; sepals ovate-oblong, 6 mm. long, acute or acutish, obscurely nerved; staminodia ligulate, exceeding the anthers, lacerate at the apex.

Loreto: Iquitos, wet soil, *Williams 1466, 3592.* Río Itaya, *Killip & Smith 29403.* Argentina to the Guianas and Colombia; Mexico and Central America.

The plant grows commonly in very wet soil, and often in water.

Alternanthera piurensis Standl. Field Mus. Bot. 11: 152. 1936.

Plants much branched, probably subscandent, the stems glabrous or when young sparsely pilose, ferruginous; leaves slender-petiolate, the blades ovate, acuminate or cuspidate-acuminate, 1.5–4 cm. long, obtuse or rounded at the base and decurrent, sparsely pilose with lax, spreading hairs; flower heads terminal and axillary, usually in clusters of 3, all sessile or nearly so, the compound heads appearing like simple heads, usually bracted at the base with reduced leaves; bracts glabrous or pilose on the costa; sepals glabrous, linear-oblong, 5 mm. long, acute or acuminate, the nerves very obscure.

Piura: Below Ayavaca, 2,600 meters, *Weberbauer 6358,* type.

Alternanthera porrigens (Jacq.) Kuntze, Rev. Gen. 538. 1891. *Achyranthes porrigens* Jacq. Hort. Schoenbr. 3: *pl. 350.* 1798. *Celosia elongata* Spreng. in Schrad. Journ. 2: 196. 1800. *C. peruviana* Zucc.

in Roem. Coll. Bot. 133. 1809. *Alternanthera sericea* HBK. Nov. Gen. & Sp. 2: 207. 1817. *Alternanthera gomphrenoides* HBK. op. cit. 2: 208. 1817. *Illecebrum gomphrenoides* Willd. ex R. & S. Syst. Veg. 5: 515. 1819. *Brandesia porrigens* Mart. Beitr. Amarant. 106. 1825. *I. sericeum* Spreng. Syst. Veg. 1: 819. 1825. *Telanthera porrigens* Moq. in DC. Prodr. 13, pt. 2: 377. 1849. *Achyranthes purpurea* Pavón ex Moq. loc. cit. in syn. *T. gomphrenoides* Moq. loc. cit. *Gomphrena sericea* Moq. op. cit. 385. 1849, not Spreng. *T. Riveti* Dang. & Cherm. Bull. Mus. Hist. Nat. Paris 28: 438. 1922.

Plants suffrutescent, large, much branched, rather stout, erect or often scandent, the stems densely pilose with appressed, white hairs, rarely glabrate in age; leaves short-petiolate, the blades ovate to elliptic or lance-oblong, acute or acuminate, commonly densely appressed-pilose on both surfaces, more conspicuously so beneath; flower heads small, numerous, forming a large panicle, purple or pink, or rarely almost white, mostly sessile in clusters of 3 at the tips of the branches, sometimes solitary on long, axillary peduncles, the clusters not bracted; bracts half as long as the calyx, ovate, mucronate, usually pubescent over the whole surface; sepals densely pilose, or sometimes glabrate above, usually long-pilose at the base, 2.5–3 mm. long, lance-oblong, acute, 1-nerved or obscurely 3-nerved; staminodia equaling the filaments, laciniate at the apex. Negs. 3225, 3216, 3204.

Huánuco: Huánuco, 2,100 meters, river cliffs, *3496; Ruiz*, type of *Achyranthes purpurea* Ruiz (photo. ex hb. Berol.); *Kanehira 266; Ruiz & Pavón 5–63*. Taruca, *Sawada 51*. Pampayacu, *Sawada P54*. Uspachaca, 2,550 meters, dry slope, *1315*.—Junín: Tarma, 2,100 meters, heavy, stony soil of steep slope, *1004; Killip & Smith 21794*.—Lima: Lima to Obrajillo, *Wilkes Exped.*—Without locality, *Weberbauer 5529*. Moquin reports *Mathews 508*. Chile to Colombia.

The material referred here shows less variation than that placed under other species. The type of *Achyranthes porrigens* is Peruvian.

Alternanthera pubiflora (Benth.) Kuntze, Rev. Gen. 538. 1891. *Brandesia pubiflora* Benth. Bot. Voy. Sulph. 157. 1844. *Telanthera pubiflora* Moq. in DC. Prodr. 13, pt. 2: 375. 1849. *T. pubiflora* var. *glomerata* Moq. op. cit. 376. 1849. *T. glomerata* Moq. loc. cit. in syn. *A. albo-squarrosa* Suesseng. Repert. Sp. Nov. 39: 1. 1935.

Plants perennial, slender or stout, sometimes suberect but more often scandent, much branched, the stems sparsely or often very

densely pilose with white, chiefly appressed hairs; leaves short-petiolate, the blades ovate or ovate-elliptic to lance-oblong, sparsely or very densely pilose with weak, subappressed, white hairs; flower heads white, globose or short-oblong, laxly paniculate, usually in clusters of 3 sessile heads at the ends of the branches, the lateral heads pedunculate, naked or the clusters often leafy-bracted at the base; bractlets much shorter than the calyx, acute or mucronate, pilose; sepals 5–8 mm. long, linear-lanceolate, densely pilose with spreading hairs, acuminate, 3-nerved, the tips often somewhat recurved; staminodia longer than the filaments, laciniate at the apex. Negs. 3229, 3217, 3226, 27880.

Arequipa: Tingo, 2,200 meters, open, rocky slopes, *Pennell 13131; Rose 18800.* Arequipa, *Isern 2506.* Mollendo, sandy hills, *Hitchcock 22372.*—Ayacucho: Plateau between Río de Lomas and Río Yauca, 1,900 meters, *Weberbauer 5759,* type of *A. albo-squarrosa.* —Junín: Below Surco, 1,900 meters, *Weberbauer 5205.*—Lima: Near Lima, *Cuming 1003* ex Moq. Chosica, *Rose 18544.* South of Santa Clara, *Rose 18622.* Posco, *Rose 18803.*—Piura: Between Piura and Ñomala, 100–250 meters, *Weberbauer 5930.* Somate, 90 meters, *Townsend 821.* Bolivia and Chile to Colombia.

The Peruvian specimens are rather more uniform in pubescence than material from other parts of South America, but they exhibit some variation in size of flowers. *A. albo-squarrosa* may be distinct, having larger flowers than some of the other specimens, but there appear to be intergrading forms.

Alternanthera pulverulenta (Mart.) Moq. in DC. Prodr. 13, pt. 2: 351. 1849. *Trommsdorffia pulverulenta* Mart. Nov. Gen. & Sp. 2: 42. 1826. *Illecebrum pulverulentum* Spreng. Syst. Veg. Cur. Post. 103. 1827. *Iresine latifolia* D. Dietr. Syn. Pl. 1: 870. 1839.

Type collected in Peru by Haenke. Moquin places the plant in a group now usually referred to the genus *Iresine.* No plant of that particular alliance is known from Peru. I suspect that *A. pulverulenta* is really a *Pfaffia,* a genus that can easily be confused with *Iresine argentata* and its relatives. The description does not agree, however, with the *Pfaffia* species represented by recent Peruvian material.

Alternanthera pungens HBK. Nov. Gen. & Sp. 2: 206. 1817. *Celosia echinata* Humb. & Bonpl. ex R. & S. Syst. Veg. 5: 531. 1819. *Alternanthera echinata* Smith in Rees, Cycl. Suppl. No. 10. 1802–1820. *Telanthera pungens* Moq. in DC. Prodr. 13, pt. 2:

371. 1849. *Alternanthera Achyrantha* var. *leiantha* Seub. in Mart. Fl. Bras. 5, pt. 1: 183. *pl. 55.* 1875.

Plants annual or perennial, the stems prostrate, much branched, villous with obscurely scaberulous, white hairs; leaves on short, marginate petioles, green when dried, rather thin, the blades orbicular or rhombic, 1.5–5 cm. long, rounded and apiculate at the apex, appressed-pilose when young, soon glabrate; heads stramineous, globose or oblong, axillary, sessile, usually solitary; bracts and bractlets lance-oblong, equaling the perianth, attenuate to an aristate apex, glabrous; sepals oblong, 5–6 mm. long, acuminate to a long, rigid tip, 3-nerved, sparsely villous near the base; staminodia triangular, remotely dentate; utricle truncate.

Huánuco: Huánuco, *Ruiz & Pavón 5–70.* Ambo, 2,100 meters, prostrate on stony river flat, *3195.* Bolivia and Argentina to Mexico and the West Indies.

Called "yerba de pollo" in Argentina and Uruguay.

Alternanthera repens (L.) Kuntze, Rev. Gen. 536. 1891. *Achyranthes repens* L. Sp. Pl. 205. 1753. *Illecebrum Achyrantha* L. Sp. Pl. ed. 2. 299. 1762. *Alternanthera Achyrantha* R. Br. Prodr. 417. 1810. *Alternanthera caracasana* HBK. Nov. Gen. & Sp. 2: 205. 1817. *Celosia humifusa* Willd. ex R. & S. Syst. Veg. 5: 531. 1819. *Alternanthera Achyrantha* var. *parvifolia* Moq. in DC. Prodr. 13, pt. 2: 359. 1848. *Telanthera caracasana* Moq. op. cit. 370. 1848. *Alternanthera parvifolia* Fawc. & Rendle, Fl. Jam. 3: 139. 1914.

Perennial from a thick, woody, vertical root, the prostrate or procumbent, branched stems forming dense mats, white-villous or glabrate; leaves petiolate, the blades rhombic-ovate to obovate, 1–2.5 cm. long, obtuse, sparsely villous when young, soon glabrate; heads ovoid or short-cylindric, 5–8 mm. thick, sessile and usually glomerate in the leaf axils, pale yellowish; bracts and bractlets shorter than the sepals, ovate, mucronate-pungent, glabrous or pilose; sepals very unequal, the outer oval or broadly ovate, 3–5 mm. long, acutish, 3-nerved, villous along the nerves with articulate, scabrous hairs; staminodia usually shorter than the filaments, triangular or subulate, entire or rarely denticulate. Neg. 3232.

Cuzco: Below Cuzco, *Rose 19071.* Vilcanota Valley, 2,900 meters, *Herrera 1071a.* Lucumayo Valley, *Cook & Gilbert 1349.*—Junín: Tarma, 2,100 meters, heavy, stony soil, *1003;* open hillside, *Killip & Smith 21860.* Huancayo, 3,400 meters, in ravine, *Ledig 41.*—Lima: Matucana, 2,400 meters, shale slope along trail, *203.*

Generally distributed in tropics of both hemispheres. "Yerba del moro."

The plant's favorite habitat in most regions of tropical America seems to be among cobblestones of village streets.

Alternanthera tomentosa (Moq.) Schinz, Nat. Pflanzenfam. ed. 2. 16c: 76. 1934. *Telanthera tomentosa* Moq. in DC. Prodr. 13, pt. 2: 380. 1849.

Plants suberect, suffrutescent, stout, 1 meter high or less, the branches densely villous-tomentose with fulvous or reddish hairs; leaves very shortly petiolate, the blades ovate or broadly elliptic to rounded-ovate, mostly 4–6 cm. long, acute to rounded at the apex, mucronate, rounded to truncate or subcordate at the base, rather thick, densely pilose above, densely villous-tomentose beneath with tawny hairs, the nerves conspicuous beneath; peduncles simple or trifid, short or elongate; flower heads globose, stramineous or whitish, about 12 mm. broad; bractlets lance-oblong, slightly shorter than the sepals, acute and apiculate, sparsely pilose or glabrate; sepals pilose, 6 mm. long, thick, 3-nerved, acute; staminodia longer than the filaments, laciniate-dentate at the apex. Neg. 27881.

Amazonas: Type from Chachapoyas, *Mathews 3130*.—Cajamarca: Montaña de Nanchó, 2,310 meters, *Raimondi 6172;* at 2,460 meters, *Raimondi 3164, 5247, 4593*. Between Chota and Ninabamba, *Raimondi 9987* (Raimondi collections det. by Suessenguth).—Huánuco: Ambo, river canyon slopes, 2,100 meters, *3155*. Also in Bolivia.

I have seen no authentic material of this species. The collection from Huánuco agrees fairly well with the original description, and it is the only collection examined that could be referred to *A. tomentosa*, as described by Moquin.

Alternanthera villosa HBK. Nov. Gen. & Sp. 2: 208. 1817. *Illecebrum villosum* Willd. ex R. & S. Syst. Veg. 5: 516. 1819. *Telanthera villosa* Moq. in DC. Prodr. 13, pt. 2: 379. 1849.

Plants herbaceous or suffrutescent, more or less scandent, densely tawny-hirsute throughout with long, spreading hairs; leaves short-petiolate, the blades ovate or broadly ovate, 2.5–6.5 cm. long, short-acuminate, rounded to acutish at the base; peduncles simple, terminal and axillary, elongate; heads globose, stramineous, 1.5 cm. broad; bracts unequal, somewhat shorter than the sepals, more or less pilose, obscurely cristulate and dentate near the apex; sepals 6–7 mm. long, attenuate to an acute apex, thinly pilose; staminodia ligulate, slightly longer than the filaments, laciniate at the apex.

Piura: Type collected near Ayavaca, *Humboldt & Bonpland.* Ayavaca, 2,700 meters, *Weberbauer 6366.* Also in Ecuador.

Easily recognized by the abundant pubescence of very long, tawny hairs.

10. GOMPHRENA L.

Annual or perennial herbs, rarely suffrutescent; leaves opposite; flowers perfect, bracteate and bibracteolate, spicate or capitate, the heads solitary or glomerate, terminal or axillary, naked or subtended by leaves, white, yellow, or red; bractlets carinate, often winged or cristate dorsally; perianth sessile, terete or compressed, 5-lobate or 5-parted, usually lanate at the base; stamens 5, the filaments united to form a tube, this 5-lobate at the apex, the lobes bifid or emarginate, the anthers sessile or stipitate in the sinuses; stigmas 2 or rarely 3, subulate or filiform, on a short or elongate style; ovary 1-ovulate.

Stems scapose, naked; a cespitose perennial from a thick root, the leaves and scapes arising from its summit.....*G. Meyeniana.*

Stems leafy and usually branched.

Bracts and bractlets very obtuse or rounded at the apex; plants small, the stems less than 8 cm. long.

Plants perennial; stems densely pilose.....*G. oroyana.*

Plants annual; stems glabrous.....*G. umbellata.*

Bracts and bractlets acute or acuminate; plants normally much larger.

Flower heads not subtended by leaves, naked.....*G. elegans.*

Flower heads subtended by large or small leaves.

Sepals not exceeding the bractlets.

Heads 2–2.5 cm. broad.....*G. globosa.*

Heads 1 cm. broad.....*G. decumbens.*

Sepals longer than the bractlets.....*G. pulchella.*

Gomphrena decumbens Jacq. Hort. Schoenbr. 4: 41. *pl. 482.* 1804. *?G. bicolor* Mart. Beitr. Amarant. 92. 1826. *Xeraea decumbens* Kuntze, Rev. Gen. 2: 545. 1891. *G. ixiamensis* Rusby, Bull. N. Y. Bot. Gard. 6: 502. 1910.

A prostrate or decumbent annual, rarely erect, usually much branched, the stems appressed-pilose; leaves short-petiolate, the blades obovate to oblong or oval, rounded or obtuse at the apex, acute to attenuate at the base, appressed-pilose; heads subglobose, white or pinkish, 1 cm. broad, usually solitary and pedunculate,

subtended normally by 2 leaves, these shorter or longer than the heads; bractlets long-acuminate, narrowly cristate at the apex; perianth shorter than the bractlets, densely lanate, the sepals oblong-linear, long-attenuate.

The species is widely distributed in tropical America, from Bolivia to Uruguay and northward to Mexico. It is included for Peru only because *G. bicolor*, whose type was collected in Peru by Haenke, appears, from description, to be a probable synonym. *Gomphrena decumbens* has been collected in Bolivia, and may well be expected in Peru.

Gomphrena elegans Mart. Nov. Gen. 2: 17. *pl. 119*. 1826. *G. perennis* L. f. *villosa* (Mart.) Stuchl. subf. *boliviana* Stuchl. Repert. Sp. Nov. 11: 154. 1913. *G. elegans* var. *brunnea* and var. *Mandonioides* Suesseng. Repert. Sp. Nov. 35: 310. 1934.

A perennial herb 60 cm. high or less, sometimes taller, branched, the branches densely pilose at first, glabrate; leaves slender-petiolate, the blades ovate-oblong to rounded-ovate, 3–7 cm. long, acuminate to acutish, at the base obtuse or acutish, sparsely or densely appressed-pilose above with long, slender hairs, beneath usually whitish and densely pilose as well as more or less tomentose, in age rarely glabrate; heads white or whitish, subglobose, 1–1.5 cm. broad, chiefly terminal and long-pedunculate, naked at the base; bracts and bractlets rather densely pilose, acute or acuminate; sepals linear-lanceolate, 5 mm. long, acute, lanate below, hirtellous above; staminodia linear-triangular, acutish.

Ayacucho: Ayacucho, 3,100 meters, *Weberbauer 5529*, type of var. *brunnea*.—Cuzco: Ollantaitambo, 3,000 meters, *Cook & Gilbert 289;* open, rocky slope, *Pennell 13667*. Without locality, *Herrera 2587*. Huasao, 3,200 meters, *Herrera 3035*. Gucay, Urubamba Valley, 2,900 meters, *Herrera 1133*. Urubamba Valley, 2,760 meters, *Herrera 2109*. Cuzco, 3,000–3,600 meters, *Herrera* in 1923. —Huancavelica: Below Colcabamba, 2,200 meters, *Weberbauer 6443*, type of var. *Mandonioides*.—Junín: Huancayo, 3,400 meters, rocky cliff, *Ledig 38*. Huacapistana, 1,800–2,400 meters, open hillside, *Killip & Smith 24193*. Huancayo, 3,400 meters, rocky cliff, *Ledig 38; Killip & Smith 22017*.—Loreto: Leticia, edge of forest, *Williams 3056*. Río Nanay, in forest, *Williams 547*. Bolivia. "Pieccacissacj."

The Loreto specimens come from far outside the expected range of the species, and their determination is decidedly doubtful, but in most characters the plants seem to agree well with those of higher

elevations. Some of the Peruvian material is probably referable to *G. Mandonii* Fries, a species perhaps not distinct from *G. elegans*.

Gomphrena globosa L. Sp. Pl. 224. 1753.

A stout annual 1 meter high or less, much branched, the stems sparsely or densely appressed-pilose; leaves short-petiolate, the blades oblong to oval, ovate, or spatulate, acute, appressed-pilose; peduncles simple, elongate; heads subtended by usually 2 short leaves, globose or short-cylindric, white, red, or yellow; bractlets broadly cristate, the crest serrulate; sepals densely lanate, lance-subulate, 1-nerved.

Loreto: Fortaleza, Yurimaguas, in garden, *Williams 4489*. San Salvador, *Williams 1555*. Mishuyacu, in clearing, *Klug 179*. Lower Río Nanay, *Williams 347*.—San Martín: Tarapoto, *Williams 6750, 6515*. Cultivated generally in tropical and temperate countries. "Siempreviva," "manto de Cristo."

This is the globe amaranth, bachelor's button, or immortelle of northern gardens, where it is a favorite ornamental plant. Probably it is a native of tropical America, although perhaps unknown in the wild state. The plant sometimes escapes from tropical gardens to waste ground and roadsides, but seldom persists long. In many regions it is employed commonly for making funeral wreaths.

Gomphrena Meyeniana Walp. Nov. Act. Nat. Cur. 19: Suppl. 1: 404. 1843. *G. acaulis* Rémy, Ann. Sci. Nat. III. 6: 350. 1846. *G. Conwayi* Rusby, Bull. N. Y. Bot. Gard. 8: 89. 1912.

Plants perennial from a long, thick, vertical root, the scapes and leaves clustered at its apex and surrounded by dense, brownish wool; leaves long-petiolate, the blades obovate to oblanceolate or even ovate, 1–3 cm. long, obtuse, pilose with long, soft hairs or often glabrate; heads white, subtended by several small leaves, globose, 1–1.5 cm. broad or sometimes slightly larger; bracts and bractlets very obtuse, thin and soft; sepals cuneate-spatulate, scarious, crenulate at the apex. Neg. 3252.

Arequipa: San Ignacio, near Cailloma, 4,400 meters, *Weberbauer 6886*.—Puno: Pisaloma (Pisacoma?), 4,500 meters, near Lake Titicaca, *Meyen* (photo. of type ex hb. Berol.). Tuapata (Puno?), 3,750 meters, *Watkins* in 1916. Puno, 4,000 meters, *Soukup 99*. Chuquibambilla, 4,000 meters, rocky, clay slope on puna, *Pennell 13352*. Collacache, *Stordy* in 1920. Chile, Bolivia, and Argentina. "Pimpinela."

An alpine plant, distinguished by dwarf habit and scapose stems.

Gomphrena oroyana Standl. Field Mus. Bot. 11: 150. 1936.

A perennial from a thick, vertical root, the numerous stems probably ascending, leafy, 5 cm. long or less, long-pilose; basal leaves long-petiolate, obovate, with blades 12 mm. long; cauline leaves on short, broad petioles, the blades elliptic-oblong to rounded-ovate, acutish or obtuse, 3–6 mm. long, sparsely and laxly white-pilose; heads dense, white, naked at the base, 8 mm. broad; bracts and bractlets hyaline, glabrous; sepals 3 mm. long, obtuse, densely lanate near the base.

Junín: La Oroya, *Kalenborn 89* (type); *Stevens 6*.

Gomphrena pulchella Mart. Beitr. Amarant. 94. 1826. *G. Haenkeana* Mart. Nov. Act. Nat. Cur. 13: 299. 1826. *G. pulchella* var. *rosea* Stuchl. Repert. Sp. Nov. 12: 523. 1913. *Xeraea Haenkeana* Kuntze, Rev. Gen. 545. 1891. *G. pulchella* var. *Haenkeana* Suesseng. Repert. Sp. Nov. 35: 311. 1934.

Plants annual, erect or ascending, almost simple or much branched, usually 30–60 cm. high, the stems pilose with long, chiefly appressed, white hairs; leaves short-petiolate, rather thick, oblong or lance-oblong, acute at each end, densely appressed-pilose; peduncles simple, elongate; heads subglobose, 2–3 cm. broad, usually pink, subtended by 2–4 leaves, these commonly shorter than the flowers; sepals elongate-linear, glabrous above, villous below, erose-denticulate at the apex; bractlets long-acuminate, narrowly cristate at the apex. Neg. 3247.

Type of *G. Haenkeana* collected in Peru by Haenke. Bolivia to Argentina and Brazil.

I have seen a photograph of the type of *G. Haenkeana*, from the Berlin herbarium. Although the specimen is a fragmentary one, it seems definitely referable to *G. pulchella*, in spite of the fact that Moquin (in DC. Prodr.) placed it near *G. globosa*, and compared it with that species. If *G. pulchella* really occurs in Peru, it is rather strange that it has not been found there by recent collectors. It may well be that the type of *G. Haenkeana* was obtained in some other country.

Gomphrena umbellata Rémy, Ann. Sci. Nat. III. 6: 349. 1846. *Xeraea umbellata* Kuntze, Rev. Gen. 545. 1891.

A diminutive annual, glabrous almost throughout, umbellately branched, 7.5 cm. high or less; leaves somewhat fleshy, spatulate, sometimes as much as 1 cm. long, obtuse, clasping at the base, the radical leaves linear-spatulate and petiolate; heads globose, dense,

rather few-flowered, pedunculate or sometimes almost sessile; outer bracts rounded-obovate, greenish, broadly rounded or subtruncate at the apex, ciliate with long, tangled hairs; bractlets white, oblong-obovate, thin, scarious, glabrous; sepals 1.5 mm. long, linear or subspatulate, obtuse or acutish, diaphanous.

Arequipa: Near Sumbay, 3,900 meters, *Weberbauer 6908*. Bolivia and Argentina.

11. IRESINE P. Br.

Plants herbaceous or woody, sometimes scandent, rarely small trees; leaves opposite, petiolate; flowers perfect, polygamous, or dioecious, bracteate and bibracteolate, capitate or spicate, the spikes numerous and paniculate; perianth terete, sessile, the 5 segments distinct, usually lanate or pilose; stamens united at the base into a short tube, the 5 filaments subulate, entire, the pseudostaminodia usually short or wanting; style short or none, the stigmas 2–3, subulate or filiform; ovule 1; utricle compressed, membranaceous, indehiscent.

Plants herbaceous.

Leaves bilobate at the apex, usually colored with purple-red, pink, and yellow ..... *I. Herbstii.*

Leaves acute or acuminate.

Leaves densely pilose beneath with very long, lax, weak, spreading hairs ..... *I. Macbridei.*

Leaves with variable pubescence but never as above, more often glabrous or nearly so.

Pubescence of the lower leaf surface and inflorescence in part of closely appressed, lustrous, yellow hairs. *I. spiculigera.*

Pubescence never of appressed, lustrous, yellow hairs. *I. Celosia.*

Plants fruticose or at least suffrutescent.

Leaves white or whitish beneath, covered with a very dense and close tomentum of branched hairs ..... *I. Weberbaueri.*

Leaves green beneath, glabrate, the sparse pubescence of straight, simple hairs.

Pseudostaminodia well developed ..... *I. Hassleriana.*

Pseudostaminodia obsolete ..... *I. tenuis.*

Iresine angustifolia Euphr. (*I. elatior* Rich.) with lanceolate or linear-lanceolate, glabrous leaves and perfect flowers, occurs in both Bolivia and Ecuador and is to be expected along the coast of Peru.

Iresine Celosia L. Syst. Nat. ed. 10. 1291. 1759. *Celosia paniculata* L. Sp. Pl. 206. 1753. *I. celosioides* L. Sp. Pl. ed. 2. 1456. 1763. *I. diffusa* Humb. & Bonpl. ex Willd. Sp. Pl. 4: 765. 1805. *I. polymorpha* Mart. Nov. Gen. & Sp. 2: 56. 1826. *I. paniculata* Kuntze, Rev. Gen. 2: 542. 1891, not Poir. 1813.

Plants essentially annual, but often persisting, sometimes low and erect, but frequently more or less scandent, nearly glabrous, the stems often villous at the nodes; leaves slender-petiolate, the blades chiefly ovate or deltoid-ovate, 5–14 cm. long, acute or acuminate, truncate to cuneate at the base, glabrous or sometimes sparsely short-villous beneath, very rarely finely pubescent; panicles usually broad and lax, sometimes narrow, the spikelets alternate, opposite, or verticillate, 5–25 mm. long; flowers usually white, the pistillate with copious, long wool at the base; sepals 1–1.5 mm. long, obtuse. Negs. 3271, 3272.

Ayacucho: Estrella, 500 meters, dense woods, *Killip & Smith 23062.*—Cuzco: Hacienda Chiraura, Prov. Quispicanchi, 3,250 meters, *Herrera 2610.*—Huánuco: Yanano, 1,800 meters, in thicket by river, *3805.* Posuso, 600 meters, in thicket or forest, *4631, 4642, 4686.* Vilcabamba, 1,800 meters, open slopes, *4980.* Muña, 2,100 meters, *4015.*—Junín: La Merced, 600 meters, edge of forest, *5378, 5345, 5576; Killip & Smith 23790.* Dos de Mayo, 1,800 meters, *Killip & Smith 25832.* Chanchamayo Valley, 1,500 meters, *Schunke 15, 482.* Above San Ramón, *Schunke A94; Killip & Smith 24732.* Puerto Bermúdez, 375 meters, in thickets, *Killip & Smith 26631.*—Loreto: Yurimaguas, in pasture, *Williams 4726.* Mishuyacu, in clearing, *Klug 548.* Florida, 180 meters, *Klug 2351.* Alto Río Itaya, *Williams 3337.* Iquitos, *Williams 8251.*—Piura: Talara, *Haught 73.* Cerro Prieto, 720 meters, *Haught F110.*—San Martín: Pongo de Cainarachi, *Klug 2614.* Zepelacio, 1,500 meters, *Klug 3510.* Tarapoto, *Williams 6696, 5794.*—Without locality, *Weberbauer 6666; Ruiz & Pavón 1642.* General in tropical America.

The plant is one of the most abundant weedy species of tropical America. Usually it is most plentiful in lowlands, but it grows also in mountains, often at rather high elevations. In the Peruvian material several reasonably distinct forms may be recognized, but when all specimens of the species from other regions are considered, it appears impossible to separate the Peruvian forms.

Iresine Hassleriana Chod. Bull. Herb. Boiss. II. 3: 390. 1903. *I. Hassleriana* var. *guaranoides* Suesseng. Repert. Sp. Nov. 35: 321. 1934.

A large, woody vine, the branches appressed-pilose or glabrate; leaves oblong to ovate or oblong-elliptic, short-acuminate, rounded to subacute at the base, sparsely appressed-pilose beneath, in age nearly glabrous; panicles very large and lax, the branches densely short-pilose with mostly appressed, ochraceous hairs. Neg. 27889.

Loreto: Iquitos, *Tessmann 3663*. Yarina-cocha, 155 meters, *Tessmann 5393*. Mouth of Río Morona, *Tessmann 3837*. Bolivia, Brazil, and Paraguay.

The determinations of the Tessmann collections, which I have not seen, are by Suessenguth.

Iresine Herbstii Hook. Gard. Chron. 1864: 654. 1864. *Achyranthes Verschaffeltii* Lem. Ill. Hort. 11: *pl. 409*. 1864. *I. Verschaffeltii* Lem. Ill. Hort. 11: sub *pl. 418*. 1864.

An erect annual, short-villosulous at the nodes; leaves long-petiolate, the blades rounded, 3–6.5 cm. long, deeply retuse at the apex, rounded to truncate at the base and decurrent, mottled or colored with purple-red, green, pink, and yellow, often with lustrous, appressed hairs on the lower surface; panicles usually ample and rather lax, 10–20 cm. long; flowers yellowish, the sepals 1 mm. long.

Loreto: Pebas, in forest, *Williams 1924*. Mishuyacu, in clearing, 100 meters, *Klug 121*.—San Martín: Moyobamba (*Mathews*). Brazil.

The plant is much cultivated for ornament in tropical America, because of its brightly colored leaves of peculiar form, and it is seen sometimes in northern parks or hothouses. It is probably only a horticultural form developed from *I. spiculigera*.

Iresine Macbridei Standl. Field Mus. Bot. 11: 152. 1936.

Plants suffrutescent, erect or subscandent, the young stems densely and laxly tomentose; leaves on very short petioles, the blades ovate or ovate-oblong, 6–8 cm. long, acuminate, obtuse at the base, conspicuously pilose on both sides with very long, weak, spreading hairs, or in age glabrate; flowers dioecious, in large, yellowish panicles; sepals 2 mm. long.

Junín: Huacapistana, 1,800–2,400 meters, open hillside, *Killip & Smith 24207*, type; *Macbride 5823*.

Closely related to *I. Celosia*, but apparently distinct in its pubescence.

Iresine spiculigera Seub. in Mart. Fl. Bras. 5, pt. 1: 228. *pl. 70*. 1875. *I. acicularis* Standl. Contr. U. S. Nat. Herb. 18: 93. 1916. *I. spiculigera* f. *pauciglandulosa* Herzog, Med. Rijks Herb. 46: 9. 1922.

Plants erect or often subscandent, large, the nodes of the branches pilose; leaves usually larger than in *I. Celosia*, thin, lance-ovate to broadly ovate, 10–25 cm. long, acuminate, rounded to attenuate at the base, more or less villous beneath, sometimes densely so, and furnished with few or numerous, closely appressed, glistening, golden hairs, similar hairs present also in the inflorescence; panicles usually large and open, yellowish; sepals 1.5 mm. long.

Cuzco: Valle del Apurímac, *Herrera*. Cuzco, *Soukup 260, 96*.—Huánuco: Huacachi, 1,950 meters, *4139*.—Junín: La Merced, 600 meters, in forest, *5426; Killip & Smith 24067*. Río Pinedo, 800 meters, *Killip & Smith 23665*.—Loreto: Mishuyacu, 100 meters, in clearing, *Klug 1380*.—San Martín: San Roque, in forest, *Williams 7200, 7629*.—Without locality: *Ruiz & Pavón 1640*. Argentina and Brazil to Central America.

The plant is doubtfully distinct from *I. Celosia*. It grows usually at rather high elevations, or at least seldom in the lowlands. *I. spiculigera* var. *picta* Suesseng. (Repert. Sp. Nov. 35: 323. 1934) is a form in which the leaves are conspicuously striped with pink or red. The type is *Raimondi 8397* from Chanchamayo, Junín, and the variety occurs also in the Putumayo region of Colombia (*Klug 1756, 1893*).

Iresine tenuis Suesseng. Repert. Sp. Nov. 35: 32. 1934. *I. tenuis* var. *discolor* Suesseng. loc. cit.

Branches slender, appressed-pilose or glabrous, fruticose; leaves short-petiolate, the blades ovate to oblong, short-acuminate, rounded to acute at the base, appressed-pilose beneath or glabrous; branches of the inflorescence very slender, sparsely pilose with short, ascending hairs, the flowers mostly inserted remotely on the ultimate branchlets, up to 5 mm. long.

San Martín: Near Tarapoto, *Spruce*. San Roque, *Williams 7466* (type of var. *discolor*). Ecuador.

The Peruvian collections are determined by Suessenguth.

Iresine Weberbaueri Suesseng. Repert. Sp. Nov. 35: 323. 1934.

An erect(?) shrub of 3 meters, the branches and lower leaf surface covered with an exceedingly dense and fine, whitish tomentum of branched hairs; leaves linear-lanceolate or linear-oblong, mostly 6–10 cm. long, short-petiolate, coriaceous, acute or obtuse and apiculate, attenuate at the base, glabrous on the upper surface; inflorescence very large, dense, and many-flowered, the flowers tomentose, 1 mm. long.

Libertad: Valley of the Marañón above Uchos, 1,800 meters, *Weberbauer 7022*, type.—Amazonas: Above Balsas, 1,000 meters, *Weberbauer 4267* (fide Suessenguth).

A very distinct species because of the abundant, pale tomentum and very narrow leaves.

61. NYCTAGINACEAE. Four-o'clock Family

By Paul C. Standley

References: Heimerl, Nat. Pflanzenfam. 16c: 86. 1934; Standley, The Nyctaginaceae of northwestern South America, Field Mus. Bot. 11: 73. 1931.

Herbs, shrubs, or trees, sometimes scandent, occasionally armed with spines; leaves simple, opposite, alternate, or verticillate, estipulate, usually entire, often marked with conspicuous raphids; flowers perfect or unisexual, sometimes dioecious, usually bracteate or involucrate, the involucre, when present, calyx-like; perianth inferior, commonly corolla-like, in fruit usually enclosing closely the pericarp, the tube short or elongate, the limb truncate or with 3–5 teeth or lobes; stamens 1–many, hypogynous; filaments usually united at the base, unequal, filiform, the anthers didymous, dorsifixed near the base, dehiscent by lateral slits; ovary included in the perianth tube, sessile or stipitate, 1-celled; style 1, the stigma simple; fruit an anthocarp, composed of the persistent, indurate base of the perianth tube enclosing the indehiscent utricle and adherent to it, costate, sulcate, or winged; seed 1, erect, the radicle inferior.—A specimen of *Pisonia macranthocarpa* Donn. Smith in the herbarium of Field Museum was collected by Ruiz and Pavón (*No. 33–78*), possibly in Peru. It is more probable, however, that it came from Ecuador, where this species is known to occur. The family Nyctaginaceae is almost wholly American.

Embryo straight; plants trees or shrubs, sometimes armed with spines; fruit juicy; flowers dioecious; leaves chiefly opposite or verticillate. (*Pisonieae.*)

Stamens included.....1. *Neea.*

Stamens exserted.....2. *Torrubia.*

Embryo curved; plants chiefly herbaceous, sometimes woody vines; fruit dry; flowers perfect; leaves opposite or alternate.

Leaves alternate.

Flowers not bracteate; plants chiefly herbaceous. (*Salpianteae.*).....3. *Cryptocarpus.*

Flowers bracteate, usually in clusters of 3, each flower adnate to a large, colored bract; plants woody, often armed with spines. (*Bougainvilleae.*).....4. *Bougainvillea.*

Leaves opposite.

Perianth lobes valvate; leaves commonly verticillate; plants often scandent; flowers minute, in umbels, not bracteate. (*Colignonieae.*).....5. *Colignonia.*

Perianth lobes induplicate-valvate; leaves chiefly opposite; plants not scandent; flowers small or large, bracteate or involucrate. (*Mirabileae.*)

Anthocarp lenticular, the broad, thin margins dentate. Flowers in 3's, surrounded by a 3-parted involucre. 6. *Allionia.*

Anthocarp not lenticular.

Flowers subtended by a gamophyllous, calyx-like involucre. 9. *Mirabilis.*

Flowers not involucrate.

Anthocarp with 5 or fewer angles.....7. *Boerhaavia.*

Anthocarp terete, 10-costate.....8. *Commicarpus.*

1. NEEA R. & P.

Shrubs or trees; leaves opposite or verticillate, rarely alternate, petiolate, entire, coriaceous to membranaceous; flowers unisexual and normally dioecious, small, sessile or pedicellate, tribracteolate at the base, arranged in lateral, axillary, or terminal cymes; staminate perianth urceolate, globose, or tubular, shortly 4–5-dentate; stamens 5–10, included, the filaments unequal; pistillate perianth urceolate or tubular, constricted above the ovary, often contracted at the mouth; stigma penicillate; anthocarp narrowly or broadly ellipsoid, crowned by the persistent free portion of the perianth.

The Amazon region of Peru and Brazil is the area in which this genus is most richly represented. The species are poorly marked, although when each is represented by a single specimen the difficulties in separating them are not so great! When there has been accumulated a large series of specimens, like that in the herbarium of Field Museum, the case is different. Almost every specimen seems to differ slightly from every other one, and it becomes necessary to distinguish species by petty differences or to consider the material as representing a few variable species, which even then are not definitely separable from one another. With the ample material at hand, it

seems impossible to prepare a satisfactory account of the Peruvian species, but it is suspected that additional material will complicate rather than simplify the matter. In the Berlin herbarium Dr. Heimerl, foremost student of the group, has indicated as new a large number of Amazonian species still unpublished, that are represented in Field Museum by photographs and fragments. I doubt that it will be possible to prepare a practical key to the forms he has distinguished, and some of them, indeed, appear to be identical. The key here presented will not be found very useful, except with ample named material for comparison.

Leaves sparsely or densely pilose or hirsute beneath, sometimes in age only along the costa.

Leaves bright green when dried, those of a pair often very unequal, the larger several times as long as the smaller. Inflorescence pendent on a very long and slender peduncle.. *N. Williamsii.*

Leaves fuscous when dried, those of a pair mostly subequal.

Bractlets much elongate and almost setiform, about equaling the perianth..... *N. hirsuta.*

Bractlets small and inconspicuous, much shorter than the perianth.

Bractlets 2–2.5 mm. long, almost half as long as the perianth. *N. oppositifolia.*

Bractlets minute, mostly 1 mm. long or less.

Nerves of the leaves chiefly straight, not arcuate. *N. subpubescens.*

Nerves strongly arcuate and upcurved..... *N. parviflora.*

Leaves glabrous, at least in age.

Leaves all or chiefly alternate, green when dried..... *N. virens.*

Leaves all or mostly opposite or verticillate.

Inflorescences mostly lateral on naked branches or on the trunk. *N. floribunda.*

Inflorescences terminal or in the axils of leaves.

Leaves bright green when dried; inflorescence lax, many-flowered, pendent on a long and very slender peduncle. *N. laxa.*

Leaves fuscous when dried.

Leaf blades small, mostly 2–5 cm. wide; inflorescence lax and open, glabrate or sparsely puberulent or hirtous. *N. Spruceana.*

Leaf blades usually 6–12 cm. wide or more; inflorescence sometimes densely tomentulose or rufous-hirtous.

Petioles mostly 4–5 cm. long; leaf blades oblong-lanceolate, very large, about equally attenuate to each end. *N. verticillata.*

Petioles less than 2.5 cm. long; leaf blades not oblong-lanceolate, sometimes oblanceolate.

Inflorescence long-pedunculate, lax and many-flowered, glabrate or appressed-tomentulose. *N. macrophylla.*

Inflorescence short-pedunculate, dense, usually densely rufous-hirtous or coarsely tomentulose. *N. divaricata.*

Neea divaricata Poepp. & Endl. Nov. Gen. & Sp. 2: 45. *pl. 161.* 1838.

A shrub or small tree, the branchlets glabrous or when young puberulent or tomentulose; leaves opposite or verticillate, fuscous when dried, subcoriaceous or thick-membranaceous, glabrous or practically so, the petioles stout, mostly 1.5 cm. long or less; leaf blades oblong to elliptic, mostly 10–23 cm. long and 5–10 cm. wide, abruptly acute to long-acuminate, acute or obtuse at the base and frequently oblique; inflorescences terminal or axillary, usually erect, short-pedunculate, commonly small and rather dense, densely rufous-hirtous or tomentulose except sometimes in fruit; perianth tubular-urceolate, ferruginous-puberulent or glabrate, 4–6 mm. long; anthocarp oblong, glabrous or nearly so, 1 cm. long. Neg. 3156.

Amazonas: Río Marañón, *Tessmann 3995* (photo. and fragm. ex hb. Berol.; indicated as a new species by Heimerl).—Loreto: Iquitos, *Williams 8062.* Río Ucayali, *Tessmann 3029* (photo. and fragm. ex hb. Berol.; indicated by Heimerl as a new species). La Victoria, in forest, *Williams 2678.* Florida, 180 meters, in forest, *Klug 2334.* —San Martín: Rumizapa, near Tarapoto, *Williams 6830.* Juan Guerra, near Tarapoto, *Williams 6906.* Tarapoto, *Williams 6507.* —Huánuco: Cochero, *Poeppig 1493* (photo. of type ex hb. Berol.). Colombia and Amazonian Brazil.

Neea floribunda Poepp. & Endl. Nov. Gen. & Sp. 2: 46. 1838. *N. cauliflora* Heimerl, Pflanzenfam. ed. 2. 16c: 129. 1934.

A shrub or tree, sometimes 6 meters high, glabrous or practically so except sometimes in the inflorescence, there sparsely and minutely puberulent; bark whitish; leaves opposite, fuscous when dried, sub-

coriaceous, the stout petioles mostly 1–2 cm. long; leaf blades obovate-elliptic to oblanceolate-oblong, 8–21 cm. long, 3–9 cm. wide, abruptly acuminate or rarely cuspidate-acuminate, the tip obtuse or acute, at the base acute or obtuse, or sometimes long-attenuate; inflorescences produced on the older branches below the leaves, or also on the trunk, small or large, mostly many-flowered and lax, the flowers sessile or nearly so, the bractlets minute; perianth glabrous, pink, 4 mm. long, tubular-urceolate; stamens 6; anthocarp ellipsoid-oblong, 9–13 mm. long, glabrous. Negs. 3148, 3145.

Loreto: Pebas, in forest, *Williams 1673*. Balsapuerto, 350–550 meters, dense forest, *Killip & Smith 28518*. Puerto Arturo, *Williams 5023*. Yurimaguas, 150 meters, *Williams 4708, 4535; Killip & Smith 27980, 27553*. Río Acre, *Ule 9365b*.—San Martín: Mainas, *Poeppig* (photo. of type ex hb. Berol.). Amazonian Brazil.

It is not at all certain that all the collections cited are conspecific, but the material is not sufficiently extensive to indicate how it may be divided into forms or species. The vernacular name is given as "mullo caspi."

Ule 9365b from the Río Acre, indicated by Heimerl as a new species, probably is not separable from *N. floribunda*.

Neea hirsuta Poepp. & Endl. Nov. Gen. & Sp. 2: 45. *pl. 161*. 1838.

A tall shrub, the branchlets hirsute; leaves ternate or quarternate, short-petiolate, the blades elliptic-oblong, short-acuminate, cuneate at the base, hirtous on both surfaces, membranaceous, about 12.5 cm. long and 5 cm. wide; peduncles axillary, pendent, long and slender, hirsute, the inflorescence lax, corymbiform, 3.5–5 cm. long, the flowers short-pedicellate; bractlets densely ciliate, 4–6 mm. long, equaling the perianth; perianth of the staminate flower tubular, red, glabrous; stamens 8–10.

San Martín: In forests of the Province of Mainas, *Poeppig*, type.

I have seen no material of this species, which, according to the original plate, must be a strikingly distinct one.

Neea laxa Poepp. & Endl. Nov. Gen. & Sp. 2: 45. *pl. 162*. 1838.

A shrub or small tree, sometimes 9 meters high, glabrous except in the inflorescence, there usually sparsely rufous-puberulent or hirtulous; leaves opposite or ternate, those of a pair often very unequal, the smaller ones mostly rounded and only 2–3 cm. long, the petioles commonly very short; leaf blades oblong to oblong-elliptic, occasionally oblong-ovate, commonly 10–17 cm. long and

3–7.5 cm. wide, abruptly acute or acuminate, sometimes long-acuminate, the tip usually obtuse, bright green when dried, membranaceous or subcoriaceous, acute to rounded at the base; inflorescences axillary, usually on very long and slender, pendent peduncles, the panicles broadly pyramidal, laxly many-flowered, the flowers sessile or nearly so; bractlets lance-subulate, minute; branches of the inflorescence slender, sometimes colored pink; perianth tubular or narrowly urceolate, 6–10 mm. long; stamens 8; anthocarp dark red or purple, oblong or narrowly ellipsoid, 12–15 mm. long, glabrous.

Junín: Río Paucartambo Valley, 700 meters, in forest, *Killip & Smith 25306*.—Loreto: Type from Yurimaguas, *Poeppig*. Puerto Arturo, in forest, *Williams 5370, 5089; Killip & Smith 27767, 27926, 27729*. San Ramón, in forest, *Williams 4554*. Yurimaguas, 135 meters, *Williams 4691; Killip & Smith 27700, 30688*. Santa Rosa, 135 meters, dense forest, *Killip & Smith 28727*. Lower Río Nanay, in forest, *Williams 583*. Caballo-cocha, in forest, *Williams 2025*.—San Martín: Tarapoto, 750 meters, *Williams 5876, 6108*. Juanjui, 400 meters, in forest, *Klug 3905;* flowers cream-colored.

Vernacular name, "puca huayo." *Weberbauer 6949*, determined by Heimerl as a new species, is closely related but possibly distinct.

Neea macrophylla Poepp. & Endl. Nov. Gen. & Sp. 2: 46, 1838.

A shrub or tree 3–12 meters high, glabrous or nearly so except in the inflorescence, there sparsely or rather densely puberulent or tomentulose; leaves opposite or verticillate, subcoriaceous, fuscous when dried, large, short-petiolate, the petioles mostly 1–2.5 cm. long, stout; leaf blades variable, mostly elliptic-oblong to elliptic, sometimes obovate or oblanceolate-oblong, 14–35 cm. long, 6.5–16 cm. wide, abruptly or gradually acuminate or long-acuminate, at the base acute to rounded, often oblique; inflorescences axillary, long-pedunculate, probably pendent, commonly large and many-flowered, the flowers sessile or short-pedicellate; staminate perianth tubular, about 12 mm. long, white or green; branches of the inflorescence pink or red; anthocarp oblong, glabrous, 15 mm. long, white. Neg. 3151.

Amazonas: Upper Marañón, *Tessmann 4808* (photo. and fragm. from hb. Berol.; indicated as a new species by Heimerl; probably referable here).—Junín: Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26638*.—Loreto: Mainas, *Poeppig* (photo. of type ex hb. Berol.). Puerto Arturo, in forest, 200 meters, *Williams 5079*. Yurimaguas, 200 meters, in forest, *Williams 4665, 3857, 3874;*

Killip & Smith 27699. Mishuyacu, near Iquitos, 100 meters, dense forest, *Killip & Smith 29886; Klug 546, 14, 16, 799.* Soledad, on Río Itaya, 110 meters, dense forest, *Killip & Smith 29635.* Iquitos, 100 meters, in woods, *Killip & Smith 27286, 29845.*—San Martín: Zepelacio, 1,100 meters, *Klug 3731.* Pongo de Cainarachi, 230 meters, *Klug 2649.* Chazuta, 260 meters, *Klug 4089.*

Here, as in the case of some of the other species, it is possible that the specimens cited represent more than a single species.

Neea oppositifolia R. & P. Syst. 91. 1798; Fl. Peruv. 4: *pl. 329.*

A shrub or small tree about 7 meters high; leaves opposite, oblong-elliptic to elliptic-obovate, abruptly short-acuminate or merely acute, short-petiolate, at the base acute or acutish, beneath sparsely pilose; staminate inflorescences arising from the upper leaf axils, apparently pendent on rather long and slender peduncles, the cymes small and rather few-flowered; stamens 8.

Junín: Forests of Pillao near Chacahuasi, *Ruiz & Pavón.*

Neea parviflora Poepp. & Endl. Nov. Gen. & Sp. 2: 46. 1838.

A shrub or small tree, 3–7.5 meters high, the young branchlets rufous-hirtellous; leaves mostly opposite, short-petiolate, thick-membranaceous, fuscous when dried, elliptic-oblong or narrowly elliptic, 7–20 cm. long, 2.5–7 cm. wide, abruptly long-acuminate, acute at the base and often very oblique, glabrous above or nearly so, beneath sparsely or densely pilose with short, spreading, rufous hairs; inflorescences axillary, small and few-flowered, erect, stout, short-pedunculate, usually umbelliform, densely rufous-hirtous or rufous-tomentose, the flowers glomerate, sessile; bractlets minute, scarcely 1 mm. long; pistillate perianth densely rufous-tomentulose, 4–5 mm. long; anthocarp oblong, 1 cm. long, pilose. Neg. 7397.

Junín: Pichis Trail, Santa Rosa, 625–900 meters, dense forest, *Killip & Smith 26191.* Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26514.*—Loreto: Iquitos, 100 meters, in woods, *Killip & Smith 27423; Williams 8120.* La Victoria, in forest, *Williams 2720.* Between Yurimaguas and Balsapuerto, 135–150 meters, dense forest, *Killip & Smith 28229.* Santa Rosa, *Williams 4915.* Yurimaguas, in forest, *Williams 4108.*—San Martín: Type from forests of the Province of Mainas, *Poeppig.* Cerro de Ponasa, *Ule 6824* (fragm. ex hb. Berol.). Also in Colombia.

Called "yana muco" in the Putumayo region of Colombia. The leaves are chewed by the Indians, making their teeth black but preserving them.

Neea Spruceana Heimerl, Notizbl. Bot. Gart. Berlin 6: 131. 1914. *N. Weberbaueri* Heimerl, Bot. Jahrb. Engl. 54: Beibl. 117: 38. 1916.

A shrub 1–4 meters high, the young branchlets glabrous, sparsely rufous-puberulent, or sparsely hirtulous; leaves opposite, ternate, or quaternate, fuscous when dried, membranaceous or subcoriaceous, the petioles mostly 4–15 mm. long, puberulent or hirtulous at first; leaf blades elliptic to oblong, mostly 7–16 cm. long and 2–5 cm. wide, sometimes somewhat broader, gradually or abruptly acuminate or long-acuminate, at the base acute to attenuate, often oblique, glabrous or practically so except sometimes when very young; inflorescences mostly erect, on a short, slender peduncle, sparsely puberulent or hirtulous, small, lax, few-flowered or many-flowered; perianth yellowish or reddish, sparsely rufous-puberulent or almost glabrous, 5.5–7.5 mm. long; bractlets 1.5 mm. long or less; stamens 5–9. Negs. 21777, 3167.

Amazonas: Pongo de Manseriche, *Tessmann 4768* (photo. and fragm. ex hb. Berol.; indicated by Heimerl as type of a new species, and perhaps distinct). Upper Marañón, *Tessmann 4285* (photo. and fragm. ex hb. Berol.; indicated by Heimerl as a new species, and possibly distinct).—Huánuco: Monsón in forest, 1,200 meters, *Weberbauer 3495* (photo. and fragm. of type of *N. Weberbaueri*, ex hb. Berol.).—Junín: La Merced, 600 meters, *5421*.—Loreto: Yarinacocha, Río Nanay, in forest, *Williams 623*. Soledad on Río Itaya, 110 meters, dense forest, *Killip & Smith 30693*. Pumayacu, *Klug 3179*. Florida, *Klug 2026*. Iquitos, edge of forest, *Williams 8187*. Río Ucayali, *Tessmann 3146* (indicated by Heimerl as a new species; photo. ex hb. Berol.).—San Martín: Tarapoto, *Spruce 4858* (type), *4883; Ule 6498* (photo. and fragm. ex hb. Berol.). Río Acre, *Ule 9367* (photo. ex hb. Berol.; indicated as a new species by Heimerl). Tarapoto, *Williams 5885*. San Roque, in forest, *Williams 7654*. Juan Guerra near Tarapoto, 720 meters, *Williams 6912*. Juanjui, *Klug 3849, 3864*. Zepelacio, *Klug 3670*. Pongo de Cainarachi, 230 meters, *Klug 2609*. Colombia.

Vernacular name, "topamaka blanca." The material referred here is variable, but it is doubtful whether it can be divided conservatively into two or more distinct species.

Neea subpubescens Heimerl, Beitr. Syst. Nyctag. 36. 1897.

A small or medium-sized tree, the young branchlets rufous-hirtellous; leaves short-petiolate, membranaceous, mostly opposite,

the petioles 5–10 mm. long; leaf blades lance-oblong to obovate-oblong, 7–10.5 cm. long, 2.5–4 cm. wide, acuminate or abruptly acuminate, acute to attenuate and more or less oblique at the base, glabrous or nearly so above, beneath densely or sparsely pilose with ferruginous, spreading hairs; inflorescences small, short-pedunculate, lax or dense, rather few-flowered, erect, broadly pyramidal, densely hirtellous, the flowers subsessile; pistillate perianth oblong-urceolate, 5 mm. long, ferruginous-puberulent near the base, glabrate above. Neg. 3169.

San Martín: Río Mayo near Tarapoto, 360–900 meters, in forest, *Williams 6267*. Rumizapa near Tarapoto, *Williams 6815, 6802*. Also in the upper Amazon Valley of Brazil. "Yntutu caspi."

It is rather probable that there should be referred to this species *Spruce 4196* from Tarapoto (not seen by the present writer), which is referred doubtfully by Heimerl (Beitr. Syst. Nyctag. 38. 1897) to *N. Selloiana* Heimerl.

Neea verticillata R. & P. Syst. 90. 1798; Fl. Peruv. 4: *pl. 328*.

A small tree, about 4.5 meters high, glabrous except in the inflorescence, there sparsely and inconspicuously puberulent; leaves ternate or quaternate, rather long-petiolate, the blades fuscous when dried, subcoriaceous, very large, narrowly oblong-lanceolate or elliptic-oblong, 25–40 cm. long, 7–10.5 cm. wide, very long-acuminate; inflorescence pendent, long-pedunculate, many-flowered, large and much branched, the branches stout, deep red; anthocarp oblong, glabrous, about 13 mm. long, greenish white. Neg. 27760.

Huánuco: Type from Posuso, *Ruiz & Pavón*. Vitoc, *Ruiz & Pavón*.—Junín: La Merced, 600 meters, in forest, *5547*.—Without locality: *Ruiz & Pavón 11–95*.

The collection from La Merced agrees perfectly with the Ruiz and Pavón illustration. The collectors of the type state that the Indians, in order to protect themselves against the bites of mosquitoes or gnats, were accustomed to rub their faces, hands, and feet with the juice of the fruit. The species is easy to recognize because of the exceptionally large and narrow leaves.

Neea virens Poepp. ex Heimerl, Beitr. Syst. Nyctag. 38. 1897.

A shrub or small tree, 1–4.5 meters high, glabrous throughout or nearly so; leaves mostly alternate, membranaceous, bright green when dried, the petioles 1–2.5 cm. long; leaf blades narrowly to broadly oblong-elliptic, sometimes oblong-obovate, mostly 10–21 cm. long and 3–7 cm. wide, gradually or abruptly acuminate or long-

acuminate, acute or cuneate at the base, the nerves 9–12 pairs; inflorescence axillary, small and few-flowered, usually scarcely longer than the petiole, sometimes as much as 6 cm. long, the branches very thick, pink, glabrous or very sparsely puberulent, the peduncles very short or rarely as much as 2.5 cm. long; staminate perianth 11–12 mm. long, oblong, glabrous; stamens 10; anthocarp dark purple, 1 cm. long. Neg. 3175.

Ayacucho: Río Apurímac Valley near Kimpitiriki, 400 meters, dense forest, *Killip & Smith 22891, 22877*.—Junín: Cochero, *Poeppig 1330* (photo. of type ex hb. Berol.).—Loreto: La Victoria, in forest, *Williams 2838;* edge of forest, *Williams 2661, 2682*. Iquitos, 100 meters, in woods, *Killip & Smith 27449*. Balsapuerto, 300 meters, dense forest, *Killip & Smith 28577*. Lower Río Nanay, *Williams 592*. Also in Brazil.

The flowers are described as either pink or white, and sometimes as greenish.

Neea Williamsii Standl. Field Mus. Bot. 8: 309. 1931.

A shrub, the very slender branches pilose; leaves short-petiolate, thick-membranaceous, bright green when dried, those of a pair very unequal, the larger blades broadly elliptic-oblong, about 17 cm. long and 7.5–8 cm. wide, abruptly short-acuminate, oblique at the base, lustrous above, with prominulous, reticulate venation, beneath rather densely spreading-pilose; blades of the smaller leaves rounded or broadly elliptic, 1.5–2.5 cm. long; pistillate inflorescence lax and open, broadly pyramidal, 5.5–9 cm. broad, the lower branches opposite or verticillate, the flowers glomerate, sessile or nearly so; peduncle very slender, 13–16 cm. long; bractlets linear-subulate, 1.5–2 mm. long; immature perianth 3 mm. long, sparsely rufous-puberulent.

San Martín: Tarapoto, 360–900 meters, *Williams 6567* (type).

2. TORRUBIA Vell.

Unarmed shrubs or trees, glabrous or pubescent; leaves chiefly opposite and petiolate, entire, membranaceous to coriaceous; flowers small, dioecious, reddish, greenish, or yellowish, exinvolucrate, 2–3-bracteolate, sessile or pedicellate, arranged in lateral or terminal, pedunculate cymes; staminate perianth obconic-campanulate, the limb 5-dentate; stamens 6–10, exserted, the filaments unequal; pistillate perianth tubular; anthocarp drupaceous, red to black. oblong, the exocarp fleshy and juicy.

The genus is represented in South America by a large number of species, but only a few are known from the western part of the continent, and only one has been discovered thus far in Peru.

Torrubia myrtiflora Standl. Field Mus. Bot. 8: 307. 1931.

A shrub or small tree, nearly glabrous except in the inflorescence; leaves opposite or ternate, fuscous when dried, the slender petioles 12–20 mm. long; leaf blades chartaceous, lance-oblong or narrowly elliptic-oblong, 9–13 cm. long, 3.5–5 cm. wide, short-acuminate, at the base acute or short-acuminate; staminate inflorescence long-pedunculate, many-flowered, 7–10 cm. broad, rather densely rufous-tomentulose; perianth 4–4.5 mm. long, densely rufous-tomentulose.

Loreto: Puerto Arturo, Yurimaguas, 200 meters, edge of forest, *Williams 5162* (type). "Clavo-caspi."

3. CRYPTOCARPUS HBK.

Large herbs or small shrubs, pubescent and usually viscid; leaves alternate, petiolate, the blades entire; flowers small, perfect, neither involucrate nor bracteate, glomerate or racemose, forming terminal and axillary, panicled cymes; perianth pyriform, green or reddish, persistent, not accrescent, the limb with 4–5 teeth or lobes; stamens 4–5; anthocarp subglobose, coriaceous, minute.

Cryptocarpus pyriformis HBK. Nov. Gen. & Sp. 2: 188. *pl. 124.* 1817. *C. cordifolius* Moric. Pl. Amér. 75. *pl. 50.* 1830. *C. cordiformis β cordifolius* Moq. in DC. Prodr. 13, pt. 2: 88. 1849. *Salpianthus pyriformis* Standl. Field Mus. Bot. 11: 95. 1931.

Plants herbaceous or suffrutescent, scandent or trailing over other plants, the stems 2–5 meters long, densely viscid-puberulent; leaves on stout petioles, the blades rhombic-ovate to broadly ovate-deltoid or rounded-ovate, mostly 2.5–5 cm. long, usually cordate or deeply cordate at the base, rounded or very obtuse at the apex, densely viscid-puberulent or tomentulose; inflorescence raceme-like, very leafy or naked, densely viscid-puberulent, the flowers subsessile; perianth less than 2 mm. long, green, pyriform in age, with spreading, white lobes; stamens 4; anthocarp globose, blackish, 1 mm. in diameter.

Cajamarca: Type collected by Humboldt and Bonpland near Contumasá and Cascas.—Piura: Region of Negritos, *Haught F63.*—Túmbez: Coastal plain between Zorritos and Túmbez, *Weberbauer 7747.* Also in Ecuador and the Galapagos Islands. Vernacular name, "nacupillo."

Haught supplies the following notes regarding the occurrence of the plant about Negritos: "A characteristic and very common, scrambling shrub of watercourses. Grows about 5 meters high when supported by other plants, elsewhere only 1–3 meters high. Trailing shoots as much as 10 meters long. Found in this region practically everywhere that there is any soil."

4. **BOUGAINVILLEA** Commers.

Shrubs or small trees, often scandent, usually armed with stout, simple or branched spines; leaves alternate, petiolate, entire; flowers perfect, either solitary and subtended by 3 bracts or usually in a 3-flowered, axillary inflorescence consisting of 3 large, persistent, often brightly colored bracts, a flower borne on the inner surface of each bract, its pedicel confluent with the costa of the bract; perianth tubular, the limb usually shallowly 5-lobed, the tube terete or 5-angled; stamens 5–10, somewhat unequal, connate at the base into a short cup; anthocarp fusiform, coriaceous, 5-costate.

Spines forked at the apex; leaves linear-spatulate or oblong-spatulate; inflorescences 1-flowered, surrounded by 3 bracts. Subgenus *Tricycla*.....*B. spinosa.*

Spines simple, or often wanting; leaves broader; inflorescences normally 3-flowered. Subgenus *Eubougainvillea.*

Perianth glabrous.....*B. peruviana.*

Perianth variously pubescent.

Perianth tube hirsute or villous.....*B. spectabilis.*

Perianth tube merely puberulent.

Leaves thin, glabrous or nearly so, at least in age; bracts when fully developed mostly 3–4 cm. long, usually acute or acuminate.....*B. glabra.*

Leaves thick, densely puberulent except when old; bracts usually less than 3 cm. long, very obtuse or rounded at the apex.....*B. pachyphylla.*

Bougainvillea glabra Choisy in DC. Prodr. 13, pt. 2: 437. 1849. *B. spectabilis* var. *glabra* Hook. in Curtis's Bot. Mag. *pl. 4810.* 1854.

A large, spiny, woody vine, the branchlets puberulent or glabrate; leaf blades broadly ovate to ovate-lanceolate, 4–10 cm. long, gradually or abruptly acute or acuminate, puberulent when young but quickly glabrate; bracts usually purplish red, broadly ovate or oval, mostly 2.5–4.5 cm. long, mostly acute or acuminate, sparsely puberulent or glabrous; perianth 15–20 mm. long; anthocarp 7–13 mm. long, sparsely puberulent or glabrate. Neg. 7405.

Loreto: Near Iquitos, *Williams 1477, 3525, 8110.* Yurimaguas, *Williams 4052.* Fortaleza, Yurimaguas, *Williams 4324.* La Victoria, *Williams 2513.* Native of Brazil.

In Peru the plant is known only in cultivation, unless it may have escaped from cultivation in the Amazon region, or persists about the sites of former dwellings. It is grown commonly as an ornamental vine in tropical regions of the whole globe, and in the United States it often is seen in hothouses.

Bougainvillea pachyphylla Heimerl ex Standl. Field Mus. Bot. 8: 308. 1931.

Usually a shrub or small tree, but sometimes scandent, armed with numerous spines, the young branchlets finely puberulent; leaf blades ovate to broadly elliptic, thick and somewhat leathery, 3–6.5 cm. long, acute or acuminate, or gradually narrowed to an obtuse apex, broadly rounded at the base, finely and usually densely puberulent; bracts rose-colored, broadly elliptic-ovate to almost orbicular, glabrate; perianth densely puberulent, 9–11 mm. long. Neg. 3094.

Piura: Without definite locality, *Raimondi 8703* (photo. of type from hb. Berol.). Frías, *Weberbauer 6432* (fragm. from hb. Berol.). Amotape Hills, *Haught F24.* "Papelillo."

Bougainvillea peruviana H. & B. Pl. Aequin. 1: 174. *pl. 49.* 1808. *Tricycla peruviana* Poir. Encycl. Suppl. 5: 359. 1817.

A shrub 3–7 meters high, erect or scandent, armed with numerous slender spines 1–2.5 cm. long, the branches sparsely puberulent or glabrate; leaves thin, slender-petiolate, the blades broadly ovate to suborbicular, 5–7 cm. long, subobtuse or abruptly acute, glabrous or nearly so except when very young; bracts bright rose, 1.5–3.5 cm. long, obtuse or rounded at the apex, glabrous except along the puberulent costa; perianth 16–20 mm. long, white or whitish; anthocarp 10 mm. long, glabrous. Neg. 27752.

Túmbez: Mountains southeast of Hacienda La Choza, Prov. Túmbez, 200–300 meters, *Weberbauer 7725.*—Piura: Type from Río Huancabamba, *Humboldt & Bonpland.* Reported from Jaén and Corazi. Occurring also in Ecuador and Colombia.

Bougainvillea spectabilis Willd. Sp. Pl. 2: 348. 1789.

A large, woody vine, armed with stout spines, the branches fulvous-villous; leaf blades broadly ovate to suborbicular, 5–10 cm. long, rounded to acutish at the base and often short-decurrent,

abruptly acute or acuminate at the apex, usually densely villous beneath; bracts purplish red, ovate-oval or broadly ovate, 2–4.5 cm. long, abruptly acute or acuminate or rarely obtuse, sparsely puberulent or short-villous; perianth 15–30 mm. long, the limb yellowish; anthocarp 11–14 mm. long, densely short-villous.

Lima: Purchased in the Lima market, *Cook & Gilbert 2075*. Native of Brazil.

This *Bougainvillea* is grown widely for ornament in tropical regions, but in cultivation it is much less common than *B. glabra*. The vernacular name at Lima is given as "papelillo."

Bougainvillea spinosa (Cav.) Heimerl in Engl. & Prantl, Nat. Pflanzenfam. 3, 1b: 27. 1889. *Tricycla spinosa* Cav. Anal. Cienc. Nat. 5: 63. *pl. 40*. 1802.

A shrub 2–4 meters high, the stout branches sparsely puberulent on the younger parts, armed with stout, rigid spines 2 cm. long or less, these furcate at the apex; leaves linear-spatulate or oblong-spatulate, 9–15 mm. long, 2–4 mm. wide, thick and fleshy, obtuse or rounded at the apex, gradually narrowed to the base, very shortly petiolate, glabrous or nearly so; flower borne on a slender peduncle 3–6 mm. long, solitary; bracts green, shorter than the flower, broadly cordate-ovate to orbicular, about 12 mm. long, sparsely rufous-puberulent; perianth 8–13 mm. long, glabrous or sparsely puberulent; anthocarp 6–7 mm. long.

Tacna: Torata, Prov. Moquehua, 2,300 meters, *Weberbauer 7414*. Also in southern Argentina.

The occurrence of this species so far from its range in Argentina furnishes an interesting and rather remarkable case of interrupted distribution.

5. COLIGNONIA Engl.

Plants herbaceous or suffrutescent, often clambering or subscandent; leaves entire, opposite or verticillate, long-petioled, those of the inflorescence often white; flowers perfect, without bracts or involucre, arranged in small and usually very numerous umbels; perianth commonly white or greenish, very small, campanulate or funnelform, 3–5-parted, the tube 3–5-angled; stamens 5–6, slightly unequal, about equaling the perianth; anthocarp ellipsoid to fusiform or orbicular, angled or winged.

Perianth normally 5-parted; anthocarp obpyramidal, angled but not winged; leaves with numerous pale raphids on the lower surface. (*Apterae.*)

Upper leaves acute or acuminate, narrow.....*C. acutifolia.*

Upper and lower leaves broad, usually rounded or very obtuse at the apex.

Leaves glabrous or nearly so beneath.....*C. Weberbaueri.*

Leaves laxly tomentose beneath.....*C. pubigera.*

Perianth 3-parted; anthocarp 3-winged; leaves without conspicuous raphids.

Leaves densely rufous-tomentose beneath.....*C. rufopilosa.*

Leaves glabrous beneath or nearly so.

Leaf blades small, mostly 1–2 cm. long, about as broad as long.....*C. microphylla.*

Leaf blades larger, most of them 3–5 cm. long.

Stamens about equaling the perianth.....*C. scandens.*

Stamens about twice as long as the perianth..*C. biumbellata.*

Colignonia acutifolia Heimerl, Denkschr. Akad. Wiss. Wien 70: 136. 1900. *C. glomerata* var. *acutifolia* Heimerl, loc. cit., in syn.

Plants herbaceous, about 1 meter long, the stems glabrate; leaves of a pair strongly unequal, the upper, bract-like ones whitish, lanceolate, the lower ones ovate-lanceolate, 5–10.5 cm. long, attenuate or acuminate, paler beneath, sparsely hirtulous beneath along the veins, elsewhere glabrous, the petioles equaling or much shorter than the blades; umbels densely many-flowered, the pedicels scarcely 1 mm. long, sparsely hirtulous; perianth 3 mm. long, sparsely hirtulous at the base, the lobes oblong, obtuse; anthocarp almost pyriform, 3–3.5 mm. long, attenuate to the base.

Cajamarca: Type collected at Cutervo, *Jelski.* Heimerl reports also *Mathews 3122,* without locality.

Colignonia biumbellata Ball, Journ. Linn. Soc. 22: 54. 1885.

An erect shrub, the branches nearly glabrous; leaves of a pair subequal, the petioles equaling or shorter than the blades; leaf blades broadly deltoid-ovate, about 4 cm. long, subobtuse at the apex, subtruncate or broadly rounded at the base, paler beneath, glabrous except for sparse hairs along the costa; umbels 10–20-flowered, the capillary pedicels 3–5 mm. long, glabrous; perianth more than 3 mm. long; stamens about twice as long as the perianth.

Lima: Type collected by Ball in the upper valley of the Rímac, near Tamboraque, at 2,700 meters.

I have seen no material of this species, but from the description probably it is scarcely distinguishable from *C. scandens,* and it may

well be synonymous with it. It may be remarked here that most species of *Colignonia* are closely related, and the characters by which some of them are separated are of apparently slight consequence.

Colignonia microphylla Heimerl, Bot. Jahrb. 54: Beibl. 117: 37. 1916.

A scandent shrub, the branches brown, puberulent at the nodes; leaves more or less unequal, small, the uppermost white, the slender petioles equaling or shorter than the blades, tomentulose or glabrate; leaf blades rounded-ovate or orbicular, mostly 1–2 cm. long, usually rounded at base and apex, appearing glabrous but really furnished beneath with an exceedingly minute, microscopic, pale tomentum; umbels few in the upper axils, few-flowered, the slender pedicels glabrous, 2 mm. long; perianth white, glabrous, 3 mm. long; immature anthocarp 2.5 mm. long, 3-winged, elliptic. Neg. 3133.

Cuzco: Yanamanche, between Cuzco and Santa Ana, among shrubs, 3,400–3,500 meters, *Weberbauer 4957* (type). Lucumayo Valley, 1,800–3,600 meters, *Cook & Gilbert 1295*.

The vernacular name is given by Cook as "sachaparaquay."

Colignonia pubigera Heimerl, Bot. Jahrb. 42: 79. 1908.

Plants herbaceous or suffrutescent, trailing over herbs and shrubs, sometimes 2 meters long, the stems sparsely puberulent at the nodes; leaves opposite or verticillate, unequal, the slender petioles equaling or shorter than the blades, puberulent or glabrate; leaf blades mostly ovate-deltoid and 4–7 cm. long, broadly rounded or subtruncate at the base, narrowed to the obtuse or acutish apex, glabrate above, beneath rufous-tomentulose, especially along the veins; umbels about 15–20-flowered, the glabrous, slender pedicels 3–4 mm. long, or in fruit as much as 6 mm.; perianth white, 3.5 mm. long, sparsely hirtulous below; stamens equaling the perianth lobes; anthocarp clavate, 5-angled, 4.5 mm. long. Negs. 3132, 6988.

Ancash: Below Cajabamba, between Samanco and Caraz, in thickets along stream, 3,000–3,100 meters, *Weberbauer 3132* (type).—Huánuco: Eighteen miles northeast of Huánuco, 3,000 meters, *2150*.—Locality uncertain: *Weberbauer 6988*.

Weberbauer 6988 has been indicated by Heimerl as a new species, but it does not appear to differ appreciably from *C. pubigera*.

Colignonia rufopilosa Kuntze, Rev. Gen. 3, pt. 2: 264. 1898.

Plants herbaceous or suffrutescent, 1–3 meters long, usually clambering, the stout branches densely ferruginous-tomentose; leaves

chiefly opposite, those of a pair subequal, the reduced ones of the inflorescence often white, the slender petioles shorter than the blades; leaf blades ovate or ovate-elliptic, 3–8 cm. long, narrowed to an obtuse apex, or the uppermost leaves often acute, green and sparsely tomentulose above, paler beneath and densely rufous-tomentose; umbels numerous, 10–25-flowered, the capillary pedicels glabrous or nearly so, 2–4 mm. long, or in fruit 5 mm.; perianth white, 2.5–3 mm. long, glabrous; anthocarp glabrous, suborbicular, 5 mm. long and broad, rounded at the base, 3-winged. Neg. 3138.

Cuzco: Lucumayo Valley, 1,800–3,600 meters, *Cook & Gilbert 1353*.—Huánuco: Vilcabamba, 1,800 meters, *5148*. Cushi, 1,500 meters, *4542*.—Junín: Carpapata, 2,700–3,200 meters, *Killip & Smith 24416*. Also in Ecuador and Bolivia.

This is the most easily recognized of the Peruvian species, by its abundant, rusty pubescence.

Colignonia scandens Benth. Pl. Hartw. 148. 1844.

Plants herbaceous or suffrutescent, erect or subscandent, the stems 1–2 meters long, glabrous or nearly so; leaves often subverticillate, the small ones of the inflorescence frequently white, the petioles mostly shorter than the blades but sometimes equaling them; leaf blades elliptic to rhombic-ovate or oblong-ovate, 2–6 cm. long, rounded or very obtuse at the apex, sometimes acute at the base, sparsely ferruginous-puberulent beneath along the veins when young, in age glabrous or nearly so; umbels commonly 8–12-flowered, the filiform pedicels glabrous, 3–4 mm. long, or in age 6 mm.; perianth green or greenish, 2.5–3 mm. long, glabrous; anthocarp suborbicular, 4–5 mm. long and broad, glabrous, rounded at the base, 3-winged.

Piura: Above Frías, 2,600–2,700 meters, *Weberbauer 6407*. Also in southern Ecuador.

Colignonia Weberbaueri Heimerl, Bot. Jahrb. 42: 78. 1908.

Plants herbaceous or suffrutescent, erect or clambering, sometimes 2 meters long, the pale, hollow stems glabrous or nearly so; leaves chiefly verticillate and unequal, the slender petioles mostly shorter than the blades; leaf blades ovate or deltoid-ovate, 3–7 cm. long, narrowed to the obtuse or rounded or occasionally acute apex, acute to subcordate at the base, thin, slightly paler beneath, glabrous or nearly so; umbels 12–20-flowered, the slender, glabrous pedicels 2–3 mm. long; perianth white, glabrous, 3–3.5 mm. long; stamens equaling or slightly exceeding the perianth lobes; anthocarp turbi-

nate-obpyramidal, 4 mm. long, glabrous, 5-angled, tapering to the base. Neg. 3139.

Amazonas: Mito, 2,700 meters, *1564*.—Ancash: Below Ocros at Alnos, 2,400–2,900 meters, *Weberbauer 2712* (fragm. of type from hb. Berol.). Between Chiquián and Tallenga, grassy thickets, 3,000–3,600 meters, *Weberbauer 2853* (according to Heimerl).—Apurímac: Río Pinco and Apurímac, 3,300–3,400 meters, *Weberbauer 5906*.—Cuzco: Hacienda Churo, Paucartambo Valley, 3,500 meters, *Herrera 1400*. Valley of the Apurímac, *Herrera*. Torontoy, Urubamba Valley, 2,400 meters, *Bingham 731, 555*. Lucumayo Valley, 1,800–3,000 meters, *Cook & Gilbert 1371*. Marcapata, 3,200 meters, *Weberbauer 7776*. Paucartambo to Tres Cruces, 3,200–3,400 meters, *Pennell 14141*.—Lima: Matucana, *411*. Obrajillo, *Wilkes Exped.* Río Blanco, 3,000–3,500 meters, open hillside, *Killip & Smith 21683*. San Buenaventura, 2,700–2,800 meters, rocky canyon, *Pennell 14525*. Río Blanco, 450 meters, *714*.—Tacna: Carumas, Prov. Moquehua, *Weberbauer 7285*.—Department uncertain: San Mateo, *Isern 2246*.

Weberbauer states that the bracts usually are white on the upper surface but green beneath. The vernacular names are reported as "lluplunsha" (Mito) and "sachaparaquay" (Lucumayo Valley). This species is closely related to *C. glomerata* Griseb., of Bolivia and Argentina, differing chiefly, if at all, in the form of the fruit. It may be that some of the Peruvian specimens, with flowers only, really are referable to *C. glomerata*.

6. ALLIONIA L.

Annual or perennial herbs; leaves opposite, petiolate, those of a pair unequal, entire or sinuate; flowers perfect, in axillary clusters of 3, each subtended by a broad, green bract, the bracts cucullate, enclosing the fruit; perianth corolla-like, the limb oblique, 4–5-lobed; stamens 4–7, exserted; anthocarp coriaceous, obovoid or oval, strongly compressed, 3-costate or cristate on the inner surface, the outer surface bearing 2 parallel, longitudinal rows of stipitate glands, the thin margins dentate or entire, inflexed.

Allionia incarnata L. Syst. Nat. ed. 10. 890. 1759. *Wedelia incarnata* Kuntze, Rev. Gen. 2: 533. 1891. *Wedeliella incarnata* Cockerell, Torreya 9: 167. 1909.

Perennial from a slender or thick, woody root, the stems short or elongate, glandular-puberulent or viscid-villous; petioles 5–20 mm. long; leaf blades mostly oval to oblong, 1–6 cm. long, unequal at

the base and subcordate or rounded, obtuse or rounded at the apex, paler beneath and glandular-puberulent or viscid-villous; involucres on slender peduncles 5 mm. long or less, the bracts obovate-orbicular, 5–8 mm. long, rounded or obtuse at the apex; perianth 7–15 mm. long, purple-red; anthocarp 3–4.5 mm. long, the inner side 3-costate, the margins with 3–5 low, broad teeth, or the teeth slender and more numerous. Negs. 3088, 3087, 3089.

Arequipa: Tingo, open, rocky slopes, 2,200 meters, *Pennell 13133*.—Ica (?): Mountains between valley of Río de las Trancas and "Llaxwa," 1,200–1,800 meters, *Hrdlicka*.—Junín: Huánuco, stony slopes, 2,100 meters, *3249*.—Lima: Chosica, rocky, sandy slope, 900 meters, *2869*. Below Cocachacra, 1,300 meters, *Weberbauer 5267*. Mountains near Chosica, 1,100 meters, *Weberbauer 5331*.—Piura: Tablazo, north of Pariñas, mostly in calcareous soil, *Haught F132, 226*.—Tacna: Torata, 2,200 meters, *Weberbauer 7417;* at 1,600 meters, *Weberbauer 7417a*.—Without definite locality: *Weberbauer 6506*. Cheuchín, *Ruiz & Pavón 12–66*. Also found in Chile and Argentina, and ranging northward to southwestern United States.

The Peruvian specimens are variable as to amount and character of pubescence, and toothing of the margins of the anthocarp.

7. BOERHAAVIA L.

Annual or perennial herbs, sometimes somewhat suffrutescent and subscandent, the stems often with viscous areas in the internodes; leaves opposite, those of a pair often unequal, petioled, the blades entire or sinuate; flowers perfect, small, variously arranged, bracteate, the bracts distinct and usually very small; perianth corolla-like, campanulate, nearly rotate, or funnelform, the limb shallowly 5-lobate; stamens 1–5, exserted or included, unequal; anthocarp cylindric to obovoid or obpyramidal, terete or 3–10-angulate, sometimes 3–5-winged, glabrous or pubescent, often furnished with stipitate glands.

Flowers in racemes; anthocarp winged.....*B. verbenacea.*

Flowers not in racemes; anthocarp not winged.

Flowers in cymes; anthocarp truncate at the apex, glabrous; perianth white or pink; plants annual, erect.....*B. erecta.*

Flowers in heads or glomerules; anthocarp not truncate, usually pubescent; perianth dark red; plants perennial, usually procumbent or prostrate.

Branches of the inflorescence glabrous; flowers mostly in clusters of 2–4 ..... *B. coccinea.*

Branches of the inflorescence puberulent or glandular-puberulent; flowers chiefly in many-flowered heads . . . *B. caribaea.*

Boerhaavia caribaea Jacq. Obs. Bot. 4: 5. 1771. *B. polymorpha* Rich. Act. Soc. Hist. Nat. Par. 1: 185. 1792. *B. hirsuta* Willd. Phytogr. 1. 1794. *B. viscosa* Lag. & Rodr. Anal. Cienc. Nat. 4: 256. 1801. *B. patula* Domb. ex Vahl, Enum. 1: 287. 1804.

Plants perennial from a thick, woody root, the stems decumbent or prostrate, below viscid-puberulent and often hirsute or villous, above densely glandular-puberulent; leaves petiolate, thick, the blades suborbicular to oval or oblong, 1.5–5.5 cm. long, truncate to rounded at the base, rounded to obtuse at the apex, glabrous or often puberulent or densely villous or hirsute; flower heads axillary or forming open cymes; perianth 2 mm. broad, puberulent or glandular-puberulent; stamens 1–3; anthocarp narrowly obovoid, 2.5–3 mm. long, 5-sulcate, densely glandular-puberulent. Neg. 27751.

Ancash: Chosica, on sandy gravel, 900 meters, *541.*—Cuzco: Santa Ana, 900 meters, *Cook & Gilbert 1471.*—Huánuco: Huánuco, *Ruiz & Pavón B28.*—Lima: Santa Clara, *Rose 18627.*—Piura: Mainly along watercourses, between the Amotape Hills and the sea, *Haught F115, 269.*—Tacna: Hills southeast of Moquehua, only one plant seen, 1,600 meters, *Weberbauer 7460.*—Without locality, *Weberbauer 6461.*

The name "raíz de China" is reported from Santa Ana.

Boerhaavia coccinea Mill. Gard. Dict. ed. 8. *Boerhaavia* No. 4. 1768. *B. paniculata* Rich. Act. Soc. Hist. Nat. Par. 1: 105. 1792. *B. adscendens* Willd. Sp. Pl. 1: 19. 1797. *B. decumbens* Vahl, Enum. Pl. 1: 284. 1804.

Plants perennial from an often fusiform and fleshy root, the stems ascending or procumbent, 1 meter long or less, minutely puberulent below or often villous, especially at the nodes, glabrous above; leaves somewhat fleshy, the blades rhombic-orbicular to rhombic-ovate or oval, 2–5.5 cm. long, subcordate to broadly rounded at the base, rounded or obtuse at the apex, pale beneath and not punctate, glabrous or sparsely puberulent, sometimes villous along the veins; peduncles 3–10 mm. long; perianth 2 mm. broad, minutely glandular-puberulent; stamens 2; anthocarp narrowly obovoid, 3–4 mm. long, 5-sulcate, densely glandular-puberulent or glandular-pilose.

Cuzco: Santa Ana, 900 meters, *Cook & Gilbert 1471*. Hacienda Chancamayo, *Diehl 2453*.—Huánuco: Huánuco, dry gulch slopes above river valley, 2,100 meters, *2329*.—Loreto: Paranapura, lower Río Huallaga, 200 meters, *Williams 4591*. Yurimaguas, *Williams 4086*.—San Martín: Juan Guerra, 720 meters, *Williams 6867*. Widely distributed as a weed in tropical America.

Boerhaavia coccinea Mill. var. **leiocarpa** (Heimerl) Standl. Field Mus. Bot. 11: 108. 1931. *B. paniculata* f. *leiocarpa* Heimerl, Oesterr. Bot. Zeitschr. 56: 252. 1906.

Anthocarp glabrous; otherwise as in the typical form of the species.

Huánuco: Ambo, steep, clay slopes, 2,100 meters, *3167*. Extending to Colombia and Argentina.

Boerhaavia erecta L. Sp. Pl. 3. 1753.

Plants annual, usually erect, 1 meter high or less, much branched from the base, the slender branches finely puberulent below, the middle internodes often with brown, viscous bands, the upper ones glabrous or minutely puberulent; leaves slender-petiolate, the blades broadly ovate-rhombic or deltoid-ovate to oval or oblong, 2–6 cm. long, truncate to rounded at the base, rounded or obtuse or rarely acute at the apex, pale beneath and usually brown-punctate, glabrous or sparsely puberulent; flowers on pedicels 1–5 mm. long; perianth 1–1.5 mm. long, glabrous; stamens 2–3; anthocarp narrowly obpyramidal, 3–3.5 mm. long, glabrous, 5-angled.

Piura: Pariñas Valley, *Haught 222, F131*. Between Piura and Ñomala, 100–250 meters, *Weberbauer 5954*. Widely distributed as a weed in tropical America.

Boerhaavia verbenacea Killip, Journ. Wash. Acad. Sci. 16: 567. 1926.

An erect or ascending annual, 1 meter high or less, the stems puberulent and more or less viscid below, glabrous above; leaves long-petiolate, rhombic-ovate to lance-oblong, mostly 2–4.5 cm. long, broadly rounded to acutish at the apex, commonly rounded or truncate at the base, pale beneath, often sparsely black-punctate, puberulent or glabrate; racemes 3–7 cm. long, paniculate, the flowers very shortly pedicellate or subsessile, the bracts large, persistent; perianth 1.5–2 mm. long, white or pale pink; anthocarp glabrous, 3 mm. long, broadly 5-winged. Neg. 3083.

Piura: Talara, Prov. Paita, *Haught 8* (type). Pariñas Valley, very abundant after rains, *Haught F133, 229.* Between Piura and Ñomala, 100–250 meters, *Weberbauer 5933.*

The species is noteworthy because it is the only one with racemose inflorescence that is known from South America.

8. COMMICARPUS Standl.

Perennial herbs or shrubs, usually reclining or more or less scandent; leaves opposite, petiolate, the broad blades fleshy, entire or undulate; flowers perfect, umbellate or verticillate, pedicellate; perianth funnelform or campanulate, corolla-like, usually with a distinct tube, the limb shallowly 5-lobate; stamens 2–5, exserted; anthocarp cylindric-fusiform, finely costate vertically, bearing numerous large glands.

Commicarpus tuberosus (Lam.) Standl. Contr. U. S. Nat. Herb. 18: 101. 1916. *Boerhaavia tuberosa* Lam. Ill. Gen. 1: 10. 1791. *B. excelsa* Willd. Phytogr. 1. 1794. *B. litoralis* HBK. Nov. Gen. & Sp. 2: 216. 1817.

Plants much branched, suberect or scandent, the stems sometimes 2 meters long, pale, glabrous except at the nodes; leaves thick and fleshy, long-petiolate, the blades broadly ovate or deltoid-ovate, 3.5–5.5 cm. long, acutish to short-acuminate, often subcordate at the base, glabrous or nearly so; flowers umbellate, the numerous umbels 4–7-flowered, the pedicels long and slender; perianth purple or purplish, 8–10 mm. long, glabrous or nearly so; anthocarp linear-clavate, 6.5 mm. long, bearing a few stalked glands near the apex.

Lima: Chosica, river valley among large rocks, 900 meters, *499.* Near Corcona, *Rose 18676.*—Piura: Talara, Prov. Paita, *Haught 100.* Also in the Galapagos Islands.

This species usually has been confused with *Boerhaavia scandens* L., which in South America is known only from northern Colombia and Venezuela. *B. tuberosa* was described from Peru, and *B. litoralis* from Patibilca, Peru.

9. MIRABILIS L.

Perennial herbs, erect or procumbent, often viscid-pubescent, the branches commonly swollen at the nodes; leaves opposite, petiolate or sessile, the blades entire or undulate; flowers perfect, involucrate, the involucre 1–several-flowered, 5-lobate, in fruit often accrescent and becoming almost rotate; perianth corolla-like, tubular to campanulate, often oblique, the limb 5-lobed, the perianth soon

withering and deciduous; stamens 3–5, unequal, usually exserted; anthocarp coriaceous, smooth or 5-angled or 5-sulcate, often constricted at the base, mucilaginous when wet.

Perianth large, 3–5.5 cm. long.....*M. Jalapa.*

Perianth smaller, less than 2 cm. long.

Anthocarp constricted at the base, conspicuously 5-sulcate; involucre strongly accrescent in age, becoming almost rotate and entire, membranaceous, and reticulate-veined.

Anthocarp glabrous; leaf blades deeply cordate at the base. *M. viscosa.*

Anthocarp pubescent; leaf blades obtuse or rounded at the base. *M. ovata.*

Anthocarp not constricted at the base, smooth or nearly so; involucre not at all or scarcely accrescent, unchanged in age.

Perianth tubular, about 15 mm. long, with only very short, erect lobes.....*M. Weberbaueri.*

Perianth campanulate or short-funnelform, with a broad limb, in most species less than 15 mm. long.

Leaves thin, mostly truncate or subcordate at the base, commonly acuminate or long-acuminate, with long and slender petioles. Stamens 3; anthocarp shorter than the involucre.....*M. prostrata.*

Leaves relatively thick, mostly rounded to acute at the base, sometimes truncate, broadly rounded to obtuse at the apex, or the uppermost leaves acute, the petioles usually stout and often very short.

Stamens 5; anthocarp subglobose, much exceeding the involucre.....*M. intercedens.*

Stamens normally 3; anthocarp shorter than the involucre.

Involucre 6.5–10 mm. long; stems thick and somewhat fistulose, glabrous below the inflorescence. *M. elegans.*

Involucre 3.5–5 mm. long; stems not fistulose, glabrous or pubescent.

Involucres very shortly pedunculate, in dense clusters; stamens usually included.....*M. expansa.*

Involucres on slender peduncles 4–7 mm. long, forming lax, open cymes; stamens exserted. *M. campanulata.*

Mirabilis campanulata Heimerl, Bot. Jahrb. 42: 75. 1908. *Allionia campanulata* Standl. Contr. U. S. Nat. Herb. 18: 101. 1916.

Plants procumbent, the branches rather slender, glabrous below or hirtulous at the nodes, in the inflorescence glandular-pilosulous; leaves rather thick, the petioles stout and mostly very short, the blades ovate to oblong-ovate, 7 cm. long or less, rounded to acute at the base, narrowed to the obtuse or acutish apex, glabrous or nearly so; inflorescence broad and open, dichotomous; involucres slender-pedunculate, narrowly campanulate, densely glandular-puberulent or viscid-puberulent, 3.5–4 mm. long, the lobes lance-triangular, subobtuse or acutish, equaling the tube; perianth red-purple, about 1.5 cm. broad; anthocarp 4 mm. long, dark brown, glabrous, nearly smooth. Neg. 3076.

Ancash: Below Pampa Romas, between Samanco and Caraz, open thickets, 2,000–2,200 meters, *Weberbauer 3198* (photo. and fragm. of type ex hb. Berol.).—Lima: Matucana, in decomposed granite, 2,400 meters, *297;* dry, rocky slope, *661.*

Mirabilis elegans (Choisy) Heimerl in Engl. & Prantl, Nat. Pflanzenfam. 3: Abt. 1b: 24. 1889. *Oxybaphus elegans* Choisy in DC. Prodr. 13, pt. 2: 431. 1849. *Allionia elegans* Kuntze, Rev. Gen. 2: 533. 1891. *M. arenaria* Heimerl, Bot. Jahrb. 42: 74. 1908. *A. arenaria* Standl. Contr. U. S. Nat. Herb. 18: 101. 1916.

Plants apparently erect and 1 meter high or less, the branches stout and fistulose, glabrous below the inflorescence, there glandular-pubescent; leaves on very stout and usually short petioles, the uppermost often sessile or nearly so, the blades thick, rounded-oval to ovate-rounded, deltoid-ovate, or rhombic-ovate, 4–9 cm. long, truncate or rounded at the base and more or less oblique, rounded to acutish at the apex, glabrous or nearly so; inflorescence large and open, dichotomous, the branches separating usually at a wide angle, the leaves of the inflorescence much reduced; involucres narrow, 6.5–10 mm. long, densely viscid-villosulous, 1-flowered, the lobes lance-triangular, about equaling the tube; perianth purple-red, 15 mm. long or less; stamens exserted; anthocarp ellipsoid, 5 mm. long, brown, obscurely costate. Neg. 7409.

Arequipa: Mollendo, sandy soil, 200 meters, *Weberbauer 1521* (photo. of type of *M. arenaria* ex hb. Berol.). Tiabaya, open, rocky hills, 2,100 meters, *Pennell 13080.* Also in Chile.

Mirabilis expansa (R. & P.) Standl. Field Mus. Bot. 11: 113. 1931. *Calyxhymenia expansa* R. & P. Fl. 1: 45. *pl. 75, f. a.* 1798.

Oxybaphus expansus Vahl, Enum. Pl. 2: 41. 1806. *Allionia expansa* Kuntze, Rev. Gen. 2: 533. 1891.

A coarse herb, suberect or even subscandent, the stems sometimes 2.5 meters long, very sparsely puberulent or villosulous or almost glabrous; leaves rather thick, on stout and usually short petioles, the blades ovate-rounded to rhombic-ovate, 2.5–5 cm. long, truncate to acute at the base and often abruptly decurrent, obtuse to rounded at the apex, or the uppermost leaves acute, sparsely puberulent or pilosulous or glabrate; inflorescence cymose-paniculate, rather small, the involucres mostly in small, dense clusters; involucre 1-flowered, 4–5 mm. long, viscid-villosulous, the lobes ovate-triangular, much shorter than the tube; perianth red-purple, 6 mm. long; stamens 3, usually not exserted; anthocarp ellipsoid, 3 mm. long, dark olivaceous, glabrous, almost smooth.

Cuzco: San Sebastián, rocky slope of canyon, 3,300 meters, *Pennell 13624.*—Junín: Tarma, 3,000–3,200 meters, *Killip & Smith 21854.*—Lima: Described from "collibus aridis Chancay et Limae ad Amancaes," *Ruiz & Pavón.* Without locality, *Ruiz & Pavón 12–37,* probably type material. Río Blanco, loose soil, 3,600 meters, *715.* Lima, *Rose 18592.* Río Blanco, open hillside, 3,000–3,500 meters, *Killip & Smith 21664.* Ranging to Venezuela and Chile.

Mirabilis intercedens Heimerl, Bot. Jahrb. 54: Beibl. 117: 36. 1916.

An ascending herb 1 meter high or less, the branches rather stout, minutely puberulent below or often glabrate; leaves short-petiolate, the upper sometimes sessile, broadly rhombic-ovate to deltoid-ovate or the upper oblong-ovate, mostly 4–6 cm. long, rounded or truncate at the base and usually somewhat oblique, sometimes abruptly decurrent or even acute at the base, obtuse at the apex, rather fleshy, glabrous or nearly so; panicles dichotomous, usually densely leafy; involucres pedunculate, villosulous or puberulent and viscid, 4–5 mm. long, 1-flowered, the lobes ovate-lanceolate, acutish, equaling the tube; perianth purple-red, 12–16 mm. long, glabrous, the limb 15–22 mm. wide; stamens 5, exserted; anthocarp globose, black, glabrous, as much as 13 mm. in diameter. Neg. 5270.

Lima: San Bartolomé, between Lima and Oroya, open thickets, 1,400–1,600 meters, *Weberbauer 5270,* type collection. Matucana, steep, rocky, northern slope, 2,400 meters, *145;* loose soil, southeast slope, *2927.*—Tacna: Mountains between Moquehua and Torata, stony places, 2,000 meters, *Weberbauer 7435.* Carumas, 2,900 meters, *Weberbauer 7268.*

This species may be recognized readily by the fruit, altogether unlike that of any other species. The perianth does not increase in size after anthesis, and it finally is scarcely noticeable at the base of the fruit. In dried specimens all the fruits are pressed flat, indicating that they must be very soft in the fresh state, and it may well be that the mature and hardened ones are still larger than is indicated in the description.

Mirabilis Jalapa L. Sp. Pl. 177. 1753. *M. odorata* L. Cent. Pl. 1: 7. 1755. *M. dichotoma* L. Sp. Pl. ed. 2. 252. 1762.

A stout, bushy-branched perennial 1 meter high or less, the branches glabrous, puberulent, or rarely short-villous; leaves slender-petiolate, the blades ovate-deltoid to lance-oblong, 5–14 cm. long, subcordate to rounded at the base, acute to acuminate at the apex, glabrous or rarely puberulent, usually ciliate; flowers in dense clusters at the ends of the branches; involucre short-pedunculate or subsessile, 7–15 mm. long, glabrous, puberulent, or short-villous, the lobes linear-lanceolate to lance-ovate, longer than the tube, acute or acuminate; perianth 3–5.5 cm. long, purplish red or white, yellow, or variegated; stamens 5; anthocarp 7–9 mm. long, 5-angled, verrucose or rugose, dark brown or black, glabrous or puberulent.

Cuzco: Alturas del Valle de Lares, *Diehl 2474*.—Junín: Posuso, 600 meters, a common weed, *4659*. Río Pinedo, north of La Merced, 700–900 meters, *Killip & Smith 23599*. La Merced, in thickets, 700 meters, *Killip & Smith 23818*.—Loreto: Iquitos, *Williams 8198, 3599*. La Victoria, *Williams 3108*. Puerto Arturo, Yurimaguas, *Williams 5010, 5229*. Mishuyacu, near Iquitos, 100 meters, in clearing, *Klug 67*. Fortaleza, Yurimaguas, *Williams 4495*.—San Martín: Tarapoto, *Williams 6501*.

This plant, the four-o'clock or marvel of Peru, is known in cultivation in most tropical regions as well as in temperate countries, and it is one of the most common garden flowers of the United States. So far as known, it does not grow wild anywhere, although often it escapes from cultivation into waste ground, and may persist there if not too hardly crowded by native plants. The early botanical writers assumed the plant to be a native of Peru, but it is more probable that it is of Mexican origin. The following vernacular names are recorded from Peru: "Buenas tardes," "clavanilla" (clavellina?). The kernels of the seeds are said to be used sometimes in Peru as a substitute for soap. The sweet-scented flowers open in the evening and close early the following morning.

Mirabilis ovata (R. & P.) Meigen, Bot. Jahrb. Engl. 18: 436. 1894. *Calyxhymenia ovata* R. & P. Fl. 1: 45. *pl. 75, f. b.* 1798. *Oxybaphus ovatus* Vahl, Enum. Pl. 2: 41. 1806. *O. chilensis* Steud. Nom. Bot. ed. 2. 2: 213. 1841. *O. campestris* Griseb. Pl. Lorentz. 39. 1874. *Allionia campestris* Kuntze, Rev. Gen. 2: 533. 1891. *A. ovata* Standl. Contr. U. S. Nat. Herb. 13: 409. 1911.

Plants coarse and stout, erect, 1 meter high or less, the branches densely viscid-villous; leaves on stout petioles, the blades thick and fleshy, ovate or deltoid-ovate, 2–3 cm. long and larger, rounded or subtruncate at the base, obtuse, rather densely viscid-pilose; inflorescence large, lax and open, the involucres short-pedunculate, densely viscid-villous, in fruit 2 cm. broad or more, the lobes short, obtuse or rounded; perianth purple-red, about 1 cm. long, sparsely villosulous; stamens 3, short-exserted; anthocarp 5 mm. long, conspicuously 5-angled, minutely pubescent. Neg. 18240.

Lima: Described from the hills of Huaura and the mountains of Lachay, Pasamayo, and Jequan, *Ruiz & Pavón.* Occurring also in Argentina and Chile.

No Peruvian specimens have been seen by the writer, but the original description and figure agree well with material from Chile and Argentina.

Mirabilis prostrata (R. & P.) Heimerl, Beitr. Syst. Nyctag. 21. 1897. *Calyxhymenia prostrata* R. & P. Fl. 1: 46. *pl. 75, f. c.* 1798. *Oxybaphus prostratus* Vahl, Enum. Pl. 2: 40. 1806. *O. micranthus* Choisy in DC. Prodr. 13, pt. 2: 432. 1849.

Plants much branched, erect or procumbent, said to be sometimes 2 meters long, the slender branches puberulent, viscid-villosulous, or glabrate; leaves slender-petioled, thin, the uppermost short-petioled, the blades ovate or ovate-deltoid, often elongate-deltoid, mostly 3–7 cm. long, truncate or subcordate at the base, acute to long-acuminate, rarely obtuse, sparsely villosulous or puberulent or more often glabrate; inflorescence cymose-paniculate, usually large and open, often leafy-bracted; involucres 4–5 mm. long, narrow, densely viscid-villosulous, the lobes narrowly triangular, mostly acute, equaling or shorter than the tube; perianth purplish red or pink, 7–10 mm. long; stamens 3, included or exserted; anthocarp 3 mm. long, glabrous, fuscous, nearly smooth. Negs. 27754, 3079.

Cuzco: Ollantaitambo, 3,000 meters, *Cook & Gilbert 415, 325, 357.* Cuzco, 3,350 meters, *Herrera 255.*—Junín: Huacachi, 1,950 meters,

sprawling at base of shrubby cliff, *4160.*—Lima: Viso, trailing on rocks along river, 2,700 meters, *769.* Lima, *Weberbauer 1624.* San Gerónimo, 150 meters, in rocks, *5892.*—Paita: Cerro Viento, *Haught 96.*—Junín: Tarma, 3,000–3,200 meters, open hillside, *Killip & Smith 21778, 21835.*—Túmbez: Mountains east of Hacienda Chicama, in deciduous bushwood, 600 meters, *Weberbauer 7661.* —Without locality: *Ruiz & Pavón 12–59.* Ecuador, Bolivia, and Chile.

Ruiz and Pavón report the vernacular name as "pegapega."

Mirabilis viscosa Cav. Icon. 1: 13. *pl. 19.* 1791. *Nyctago parviflora* Salisb. Prodr. 57. 1796. *Calyxhymenia viscosa* R. & P. Fl. 1: 46. 1798. *Calymenia viscosa* Pers. Syn. Pl. 1: 36. 1805. *Vitmania viscosa* Turra ex Steud. Nom. Bot. 140, in syn. 1821. *Oxybaphus viscosus* L'Hér. ex Choisy in DC. Prodr. 13, pt. 2: 430. 1849. *Allionia viscosa* Kuntze, Rev. Gen. 2: 533. 1891.

A coarse herb 0.5–1.5 meters high or even larger, the stems sometimes as much as 5 cm. thick, the branches densely viscid-pilose; leaves rather thick, long-petiolate, the blades broadly cordate-ovate or ovate-deltoid, 3–10 cm. long, usually cordate and abruptly short-decurrent at the base and acute to acuminate at the apex, short-villous or puberulent, especially beneath; inflorescence large, openly paniculate, the branches chiefly opposite, densely viscid-villous; involucres at anthesis 3–5 mm. long, in fruit 15–25 mm. broad, densely viscid-pilose; flowers solitary or rarely 2–3 in the involucre, the perianth 8–20 mm. long, purplish red, pink, or white, the limb 15–25 mm. broad; stamens 3; anthocarp 5 mm. long, glabrous, densely covered with large, coarse tubercles.

Ica: Above Pisco, between Pámpano and Huaytará, 1,300 meters, *Weberbauer 5389.*—Huánuco: Huánuco, *Ruiz & Pavón 12–60.* Type from Huánuco. Huánuco, 2,100 meters, in gulches on steep, dry slopes, *2036;* on stony slopes in shale and gravel, *3208.* Chaulki, Huánuco, *Sawada P73.*—Lima: Open, rocky slopes, along Río Chillón, near Viscas, 1,800–2,000 meters, *Pennell 14459.* Above San Bartolomé, Prov. Huarochiri, 1,500–1,800 meters, *Weberbauer 5261.* Colombia, Ecuador, and Mexico.

Mirabilis Weberbaueri Heimerl, Bot. Jahrb. 42: 73. 1908.

Plants apparently procumbent, the branches densely viscid-villosulous; leaves slender-petiolate, the blades broadly ovate, 6.5 cm. long or smaller, rounded to subcordate at the base, obtuse or rounded at the apex, viscid-villosulous; inflorescence cymose-paniculate, lax

and open, the involucres slender-pedunculate, densely glandular-puberulent, broadly campanulate, 6–7 mm. long, 1-flowered, the lobes triangular, acutish, slightly longer than the tube; perianth purplish, tubular, 15 mm. long, hirtulous along the nerves, very shortly 5-lobate; stamens 3, exserted; anthocarp 4–5 mm. long, brownish, glabrous. Neg. 3082.

Ancash: Below Pampa Romas, between Samanco and Caraz, 2,100–2,400 meters, *Weberbauer 3185* (photo. and fragm. of type ex hb. Berol.).

62. BATIDACEAE. Batis Family

This family consists of a single species, widely distributed on tropical and subtropical shores of the New World, but the plant seems to be rare on the coast of Peru. Compare Weberbauer (p. 18, Part I of this work), whose remark implies rather that it is rarely collected.

1. BATIS L.

A smooth, sprawling, oppositely branched shrub with fleshy, narrow, nearly terete, opposite leaves and dioecious flowers in strobiles solitary in the leaf axils; staminate strobiles sessile, the pistillate pedunculate.

Batis maritima L. Syst. ed. 10. 1289. 1759.

The plant is known from Hawaii, and on American shores it extends north to those of Florida and California.—Illustrated, Mart. Fl. Bras. 3, pt. 3: *pl. 126*.

Lambayeque: *Raimondi* (det. Ulbrich).—Túmbez: Coastal plain between Túmbez and Zarumilla, a small shrub in salt soil, *Weberbauer 7621*.—Piura: Negritos, just behind the beach, 25 miles north of Cabo Blanco, growing about 1 meter high, seen also near Negritos and 6 miles south of Paita, *Haught 204*. Zorritos, *Haught 204*.

63. PHYTOLACCACEAE. Pokeweed Family

Reference: H. Walter, Pflanzenreich IV. 83. 1909.

In Peru, as elsewhere, this family is known for the high repute in which some of its members are held as medicinal plants, for which, however, there appears to be no scientific basis. Included here for convenience is the genus *Achatocarpus* Triana, the type genus of the family Achatocarpaceae Heimerl, a group which is academically, that is to say logically, separable; its near affinity is with the Aizoaceae (see Heimerl, Pflanzenfam. ed. 2. 16c: 174–178. 1934).

In addition to the following, *Ercilla spicata* (Bert.) Moq. (*E. volubilis* Juss.) has been repeatedly accredited to Peru on the basis of a Dombey specimen, in this instance, as suggested by Harms, Pflanzenfam., op. cit. 154, certainly mislabeled, as are so many Dombey plants.

Inflorescence a simple raceme or spike (except *Phytolacca thyrsiflora*).

Racemes 6–10-flowered, crowded, partly in clusters of 2 or 3; shrubs.....1. *Achatocarpus.*

Racemes mostly many-flowered, solitary; plants herbaceous or green, at least above.

Flowers minute (about 1 mm. long); fruits rough...2. *Microtea.*

Flowers often small but longer than 1 mm.; fruits smooth.

Flowers remote, closely appressed to the rachis..3. *Petiveria.*

Flowers often crowded, never appressed to the rachis.

Fruits of solitary carpels.

Sepals broad, widely spreading to reflexed. 4. *Trichostigma.*

Sepals often narrow, erect or suborbicular.

Sepals 3-connate; pedicels short (2, rarely 3.5 mm. long).....6. *Hilleria.*

Sepals all free; pedicels 3–6 mm. long.

Fruit baccate; stamens 4.....5. *Rivina.*

Fruit dry; stamens 12–15.....7. *Schindleria.*

Fruit a ring of carpels.....9. *Phytolacca.*

Inflorescence paniculate (in Peruvian species).

Fruit baccate; sepals pale, paper-like.....8. *Flueckigera.*

Fruit a samara; sepals herbaceous.

Sepals 4, erect.....10. *Gallesia.*

Sepals 5, becoming reflexed.....11. *Seguieria.*

1. ACHATOCARPUS Triana

A stout shrub with short, gray-barked branchlets, short-clustered racemes, and broadly oval leaves. Flowers unisexual. Stamens 12–15, irregularly inserted. Fruit baccate.—Regarding the position of this genus see remarks at the beginning of the family.

Achatocarpus pubescens C. H. Wright, Kew Bull. 1906: 6. 1906. *A. mollis* H. Walt. Pflanzenr. IV. 83: 136. 1909.

A shrub 3–4 meters high, the young branches and leaves beneath densely pilose; petioles 5 mm. long; leaf blades usually rounded or obtuse at the apex, 10 cm. long and 4.5 cm. broad; racemes 6–10-flowered, pilose, the pedicels 2 mm. long.—Illustrated, Pflanzenr. IV. 83: 135.

Prov. Túmbez at 200 meters, *Weberbauer 7693*. Ecuador.

Achatocarpus praecox Griseb. Goett. Abh. 24: 32. 1879.

Similar to *A. pubescens*, but the branchlets shortly spinescent and the more lanceolate leaves only about half as large. Neg. 27741.

Peru: Without locality (*Pavón*). Argentina.

2. MICROTEA Sw.

The Peruvian species slender annuals with short or long racemes of tiny flowers. Stamens 3–9, in one series. Carpels 3, minute.

Microtea debilis Sw. Prodr. 53. 1788; 128.

Weak and prostrate or ascending; leaves thin, usually somewhat obovate; racemes dense, in fruit to 3 cm. long; pedicels scarcely 1 mm. long; sepals and stamens 5, about 0.5 mm. long; fruit tuberculate or echinate.

San Martín: Tarapoto, *Raimondi* (det. Heimerl); at 750 meters, *Williams 5573*.—Loreto: Maucallacta, 200 meters, in clearing, *Klug 3959*. Yurimaguas, 200 meters, *Williams 4081;* in waste places, *Killip & Smith 28215*. Río Putumayo, *Klug 1647*. Yurimaguas, *Poeppig 2303*.—Río Acre: *Ule 9363*.—Puno: Sangabán, *Lechler 2443*. Widely distributed in tropical America.

Microtea maypurensis (HBK.) G. Don in Loud. Hort. Brit. ed. 2. 98. 1839; 132. *Ancistrocarpus maypurensis* HBK. Nov. Gen. & Sp. 2: 186. 1817.

Similar to *M. debilis* but often erect, the leaves narrower, to linear-lanceolate, and the racemes lax, the slender pedicels 1.5 mm. long or longer; stamens 6–8, nearly 1 mm. long.—Illustrated, Pflanzenreich IV. 83: 133.

Túmbez: Prov. Túmbez, 200 meters, *Weberbauer 7729*.—Puno: Sangabán (*Lechler*). South America.

3. PETIVERIA L.

Well characterized by the long, slender, spike-like racemes of remote flowers that are ascending or closely appressed to the rachis. Stamens 4–8. Sepals free. Fruit elongate, with 4–6 setae at the

apex.—Standley, Contr. U. S. Nat. Herb. 23: 265, has compiled an amazingly long list of reputed medicinal uses; its reputation as a medicinal plant apparently results from the garlic odor it emits when crushed.

Petiveria alliacea L. Sp. Pl. 342. 1753; 118.

Slender, usually somewhat woody below; petioles to 6 mm. long; leaves oblong-elliptic, nearly glabrous, about 10 cm. long and half as broad; racemes erect, axillary and terminal, exceeding the leaves; pedicels rarely 1 mm. long; fruit to 8 mm. long, with 4 or rarely 5 setae.—P. *tetrandra* Gómez (*P. alliacea* var. *tetandra* Hauman-Merck, Anal. Mus. Nac. Buenos Aires 24: 501, 513, 1913) of Brazil is a form only that has fruit with 6 setae. According to Raimondi, the plant has diuretic properties. Illustrated, Pflanzenreich IV. 83: 119.

Ayacucho: Prov. La Mar, *Raimondi.* Aina, 750–1,000 meters, in clearing, *Killip & Smith 22828.*—Cajamarca: Jaén, 1,000 meters, *Weberbauer 6197.*—Cuzco: Prov. Convención, *Raimondi.* Quebrada Versalla, *Diehl 2499a.*—Loreto: Iquitos, *Williams 3534, 7913.* Puerto Arturo, 200 meters, *Williams 5221, 5183.* Pinto-cocha, *Williams 823.* Mishuyacu, 100 meters, in clearing, *Klug 439, 946.* Yurimaguas, 200 meters, *Williams 4652.*—San Martín: Tarapoto, 800 meters, *Williams 6901, 5762.* Juanjui, 400 meters, *Klug 3833.* —Túmbez: *Raimondi.* South America to southern United States. "Chanviro," "mucurá."

4. TRICHOSTIGMA A. Rich.

Villamilla R. & P. Fl. *pl. 402,* ex Moq. in DC. Prodr. 13, pt. 2: 10. 1849.

This often clambering shrub is similar to *Rivina,* but the stamens are 8 to many and the stigma is sessile and penicillate.

Petioles stout, 0.5–3 cm. long, more or less pubescent. . *T. peruvianum.*
Petioles slender, 2–4 cm. long, glabrous. . . . . *T. octandrum.*

Trichostigma octandrum (L.) H. Walt. Pflanzenr. IV. 83: 109. 1909. *Rivina octandra* L. Cent. Pl. 2: 9. 1756. *Villamilla octandra* Hook. f. in Benth. & Hook. f. Gen. 3: 81. 1880.

Scandent, the elongate branches pale verruculose-lenticellate; petioles to 2 cm. long; leaf blades chartaceous, glabrous, about 10 cm. long and 4.5 cm. wide; racemes of white or purple flowers spreading, often to 10 cm. long and 1 cm. thick; pedicels to 6 mm. long;

sepals green, ovate, 4 mm. long, little enlarged in fruit; fruit baccate, black.—Illustrated, Pflanzenreich IV. 83: 109.

Loreto: Mainas (*Poeppig 2404*). San Seidro, Marañón, *Tessmann 4992.* Middle Río Santiago, *Tessmann 4563.* Yarina-cocha, *Tessmann 3395* (det. Schmidt). Iquitos, in forest, 120 meters, *Williams 7910, 8045.* Fortaleza, 200 meters, edge of forest, *Williams 4275.* Río Nanay, *Williams 540.*—San Martín: Juan Guerra, 720 meters, in forest, *Williams 6854.* Argentina, Bolivia, and the Amazon region to Mexico and the West Indies.

Trichostigma peruvianum (Moq.) H. Walt. Pflanzenr. IV. 83: 111. 1909. *Rivina peruviana* Moq. in DC. Prodr. 13, pt. 2: 10. 1849. *Villamilla peruviana* Hook. f. in Benth. & Hook. f. Gen. 3: 81. 1880. *V. tinctoria* R. & P. Fl. *pl. 402,* ex Moq. loc. cit.

Scarcely distinguishable from the preceding except by the pubescent young branchlets, often subcordate leaves, and larger inflorescence of dark brown flowers, this sometimes over 30 cm. long and 15 cm. wide.—The fruit is unknown. Neg. 29487.

San Martín: Tarapoto, *Williams 6953* (det. Schmidt).—Amazonas: Moyobamba, 1,100 meters, *Weberbauer 4555* (type); (*Mathews 1455*).—Junín: Chanchamayo, *Raimondi.*—Loreto: Balsapuerto, *Klug 2976; Killip & Smith 28690.* Vochiza, *Ruiz & Pavón.* Between Yurimaguas and Balsapuerto, 110 meters, *Killip & Smith 28344;* a shrub of 1.5–2.5 meters, the flowers white. Soledad, 110 meters, in forest, *Killip & Smith 29696;* a tree of 3–4.5 meters; calyx pink.

5. RIVINA L.

In aspect like *Hilleria,* but the sepals free and the fruit baccate. Stamens 4. Style short, the stigma capitate.

Rivina humilis L. Sp. Pl. 121. 1753; 102.

A somewhat woody plant with slender, dichotomous branchlets; leaves ovate to elliptic, membranaceous, often lightly pubescent on the nerves, 7.5 cm. long and 4 cm. broad or smaller or larger; inflorescence racemose, little or not exceeding the leaves; sepals 2 mm. long, spreading and enlarged in fruit; fruit red or orange, to 4 mm. thick.—The glabrous form is var. *glabra* L. The plant has spread to Madagascar, Australia, and elsewhere as a weed, and when eaten by cows is said to impart to the milk a disagreeable odor. The English gardener Philip Miller recorded the placing of the berries in water for cut flowers, in order to color the blossoms. The plant

was already in cultivation in Europe in 1699. Illustrated, Pflanzenreich IV. 83: 103.

Cajamarca: Jaén, *Raimondi.*—Junín: Chanchamayo, *Raimondi.* Tropical and subtropical America.

6. HILLERIA Vell.

Herbaceous or somewhat suffrutescent, and in aspect not unlike *Phytolacca,* but often distinctive in the herbarium by the nearly black dried inflorescences. Leaves usually slightly pubescent. Flowers perfect. Carpels solitary. Perianth oblique, of 3 sepals.

Stamens always 4; style shorter than the ovary or none.

Stigma sessile..... *H. latifolia.*

Stigma evident..... *H. secunda.*

Stamens usually 5–9; style equaling the ovary.

Stamens 5–7; style elongate..... *H. Meziana.*

Stamens 8–13; stigma sessile..... *H. longifolia.*

Hilleria latifolia (Lam.) H. Walt. Pflanzenr. IV. 83: 81. 1909. *Rivina latifolia* Lam. Illustr. 1: 324. 1791.

Erect, suffrutescent, often 1.5 meters high, with slender branchlets, the younger green and pilose; petioles to 4 cm. long; leaf blades elliptic-ovate, thin, finally glabrate or pilose on the nerves beneath, to nearly 9 cm. long and half as broad; racemes dense, erect, scarcely or little exceeding the leaves, to 14 cm. long and 9 mm. thick; pedicels 2 mm. long; sepals 1.8 mm. wide, in fruit enlarged, papery, reticulate-veined; stigma sessile, slightly penicillate.—Illustrated, Pflanzenreich IV. 83: 81.

San Martín: Zepelacio, 1,200–1,600 meters, *Klug 3438.* San Roque, 1,400 meters, *Williams 7611.* Tarapoto, *Williams 6884, 5757.* Near Moyobamba, *Klug 3438.*—Loreto: Fortaleza, 200 meters, edge of forest, *Williams 4274, 4432.* Santa Rosa, 135 meters, *Killip & Smith 28904.* Yurimaguas, *Poeppig 2163b.* Yarinacocha, *Tessmann 3408.*—Río Acre: *Ule 9362* (det. Pilger).—Cuzco: Alto Río Urubamba, *Diehl 2423a.* South America; Africa.

Hilleria longifolia (H. Walt.) Heimerl, Pflanzenfam. ed. 2. 16c: 151. 1934. *H. latifolia* (Lam.) H. Walt. var. *longifolia* H. Walt. Pflanzenr. IV. 83: 82. 1909.

Leaves subequal; inflorescence about 20 cm. long; stamens numerous.—Otherwise like *H. latifolia.*

Huánuco: Río Chinchao, *Poeppig 1541.*

Hilleria Meziana H. Walt. Pflanzenr. IV. 83: 83. 1909. *Mohlana Meziana* H. Walt. Bot. Jahrb. 37: Beibl. 85: 25. 1906.

In general similar to other species, but the mature leaves chartaceous, somewhat pubescent on the margins, and rather prominently reticulate-veined beneath; stamens 4–7, 4 alternate with the sepals; style cylindric-filiform, slightly curved, equaling the ovary, the stigma penicillate. Neg. 5723.

San Martín: Near Tarapoto, *Ule 6500* (type). Morales, in forest, *Williams 5668.*

Hilleria secunda (R. & P.) H. Walt. Pflanzenr. IV. 83: 82. 1909. *Rivina secunda* R. & P. Fl. 1: 65. 1794. *R. inaequalis* Hook. Icon. *pl. 130.* 1837.

Very similar to *H. latifolia,* but the costa only obscurely mucronulate and the fleshy style about 0.5 mm. long with a scarcely penicillate stigma. Neg. 27746.

Huánuco: Río Huallaga Canyon, 1,200 meters, *4221.* Posuso, Vitoc, *Ruiz 211* (type).—San Martín: Rumizapa, *Williams 6753.* San Roque, 1,400 meters, *Williams 7489.* Tarapoto, *Spruce 4306.* Alto Río Huallaga, *Williams 6709.*—Cajamarca: Jaén, 1,000 meters, *Weberbauer 6194.*—Túmbez: *Raimondi* (det. Heimerl).—Cuzco: Prov. Convención, *Raimondi* (det. Heimerl).—Junín: La Merced, 600 meters, *5310.* Chanchamayo, *Isern 2369, 2066.* South America.

7. SCHINDLERIA H. Walt.

Shrubs, or at least woody below, resembling *Rivina* but with 12–15 irregularly disposed stamens and a dry fruit.

Plant drying black.....*S. glabra.*

Plant drying yellowish green.....*S. Weberbaueri.*

Schindleria glabra H. Walt. Bot. Jahrb. 36: Beibl. 85: 24. 1906.

Erect, glabrous throughout; leaves nearly ovate-elliptic, narrowly acuminate, about 15 cm. long, 6 cm. wide, the petioles to 5.5 cm. long; racemes dense, suberect, to 15 cm. long and 1.5 cm. thick, the pedicels to 6 mm. long; sepals 4, 3 mm. long, red and enlarged in fruit; stamens about 16.—The related Bolivian *S. racemosa* (Britton) H. Walt. Bot. Jahrb. 37: Beibl. 85: 24. 1906, and *S. mollis* H. Walt. Pflanzenr. IV. 83: 116. 1909, have leaves pubescent beneath, the first with short, the second with elongate pedicels. Illustrated, op. cit. 115.

Puno: Chunchosmayo, 900 meters, *Weberbauer 1168.*

Schindleria Weberbaueri O. C. Schmidt, Notizbl. Bot. Gart. Berlin 8: 313. 1923.

Similar to *S. glabra*, but the leaves obtusely acuminate, on petioles to 12 mm. long; sepals scarcely longer than 2.5 mm., little enlarged in fruit, greenish.—*S. rivinioides* (Rusby) H. Walt. Bot. Jahrb. 37: Beibl. 85: 24. 1906, has flowers in loose racemes; *S. rosea* (Rusby) H. Walt. Bot. Jahrb. 37: Beibl. 85: 24. 1906, has rose-colored flowers in dense racemes. A shrub of 3 meters; flowers white.

Huánuco: Mairo Valley, 400 meters, *Weberbauer 6758* (type).—Cuzco: Lares Valley, 1,900 meters, border of forest, *Weberbauer 7924, 7924a* (det. Schmidt).

8. FLUECKIGERA Kuntze

Ledenbergia Klotzsch. This genus is well marked by the long, pendulous inflorescence, composed of several to many slender racemes that are particularly conspicuous in fruit, because of the papery, stellately spreading sepals. The 12 stamens are regularly disposed, 8 alternate with the sepals.—The original name of Klotzsch commemorates, though falsely written, that of a professional politician; the same individual had been honored by *Ladenbergia* Klotzsch in 1846, for which reason Kuntze changed the later name to *Flueckigera*. I follow Kuntze, believing that to accept two scientific names of the same personal origin which differ by an accidental (not deliberate) change in spelling as slight as this is condonable in neither the name of science nor of common sense, all arbitrary rules and regulations to the contrary notwithstanding.

Flueckigera peruviana (O. C. Schmidt) Macbr., comb. nov. *Ledenbergia peruviana* O. C. Schmidt, Notizbl. Bot. Gart. Berlin 8: 313. 1923.

A shrub 4 meters high, the slender branchlets minutely lineate-puberulent; petioles about 3.5 cm. long; leaf blades elliptic, acuminate at both ends, glabrous, to 10 cm. long and half as wide; panicle to 25 cm. long, 18 cm. wide; pedicels 3 mm. long; sepals narrowly oblong, rounded at the apex, white, 4 mm. long, becoming 2 mm. longer in fruit, the fruit 2.5 cm. thick.

Piura: Ayavaca, *Weberbauer 6413* (type).

9. PHYTOLACCA L.

Nearly smooth, green-branched shrubs or trees with ovate-elliptic, pointed leaves and racemose or spicate flowers. Inflorescences terminal but finally pseudo-lateral. Carpels 5–16, forming a de-

pressed-globose, baccate fruit.—The young shoots and leaves of several species are cooked as "greens," and the roots or other parts, which contain saponin, rubbed in water, form suds that serve in place of soap or as an aid to it.

Racemes spiciform, the pedicels very short, rarely 3.5 mm. long and then the lower not longer than the upper.

Inflorescence shorter than or little exceeding the leaves.

Flowers scarcely touching; carpels free at the tip . . . *P. dioica.*

Flowers very crowded, touching; carpels connate. . *P. bogotensis.*

Inflorescence much longer than the leaves. . . . . *P. icosandra.*

Racemes open, the flowers sometimes contiguous but at least some of the pedicels 5 mm. long or longer.

Inflorescence simply racemose.

Stamens little or not at all exceeding the sepals. . . *P. rivinoides.*

Stamens much exceeding the sepals, conspicuous. *P. Weberbaueri.*

Inflorescence paniculate at the base. . . . . *P. thyrsiflora.*

Phytolacca bogotensis HBK. Nov. Gen. & Sp. 2: 183. 1817; 60. *P. australis* Phil. Anal. Univ. Chile 43: 536. 1873.

A smooth, green, tree-like shrub, the stout branches scarcely or little angled; petioles to 4 cm. long, grooved and angled; leaf blades oblong-elliptic or broadly lanceolate, acute at both ends or acuminate, the base decurrent, usually chartaceous and white-punctate, to about 10 cm. long and 4 cm. broad; racemes suberect, many-flowered, to only 4.5 cm. long and 13 mm. thick, the peduncles to 1 cm. long; flowers perfect, the pedicels 3 mm. long; stamens (8–12) and sepals subequal; ovary 8–10-carpellate, the carpels completely joined; fruit baccate.—In Colombia called "guaba." Herrera records from Cuzco, and Ball from Matucana, probably as an introduction or escape, the similar *P. octandra* L., a species ranging from Mexico to Colombia and widely naturalized elsewhere; its racemes, to 50 cm. long, about equal the leaves. Neg. 5713.

Cajamarca: Nanchó, *Raimondi.*—Amazonas: Chachapoyas to Moyobamba, *Raimondi.*—Huánuco: Twelve miles south of Panao, *2214.* Mito, 2,700 meters, *1549.*—Ayacucho: Huanto, *Weberbauer 5592* (det. Pilger).—Huancayo: Chávez (coll.?; det. Schmidt).—Cuzco: Machupicchu, *Soukup 193.* Prov. Calca, *Herrera 354.* Prov. Urubamba, 3,200 meters, *Herrera 510, 668* (det. Mansfeld), *688.* Valle de Paucartambo, *Herrera 3373.*—Without locality (*Dombey*).—Junín: Yanahuanca, *1215.* Huasa-huasi, *Ruiz & Pavón*

(det. Schmidt).—Huánuco: Vitoc, *Isern 2558, 2224.* Colombia to Chile. "Choclo-choclo," "ailambo."

Phytolacca dioica L. Sp. Pl. ed. 2. 632. 1763; 47.

Except for the pedicels, a glabrous, evergreen shrub, pale-verruculose at the stout and angled nodes; petioles slender, to 4 cm. long; leaf blades ovate, acute or acuminate, rounded but slightly decurrent at the base, thick, lightly reticulate-veined beneath, sometimes over 10 cm. long; racemes more or less nodding, to 12 cm. long, on peduncles to 1.5 cm. long; flowers dioecious, the ovary rudimentary in the staminate, the pistillate rarely with staminodia; pedicels in the former rarely 4 mm. long, in the latter 3 mm. long; sepals elliptic, white-punctate, 3.5 mm. long, much exceeded by the 20–30 stamens; ovary globose, 7–10-carpellate, the carpels connate at the base.—This abundantly flowered, gigantic-based plant, often planted for shade, is known in the southern part of its range as "ombú" or "umbú" or elsewhere as "bella sombra" or "belombra." See Record & Mell, Timbers Trop. Amer. 157. 1924, for a description of the wood. Illustrated, Pflanzenreich IV. 83: 48.

Peru: Without locality: *Raimondi;* (*Haenke*). Extending to Argentina.

Phytolacca icosandra L. Sp. Pl. 631. 1753; 60.

A shrub allied with and in general similar to *P. bogotensis,* but generally recognizable by the spicate or racemose inflorescence, which is usually terminal and much longer than the leaves; flowers subsessile or rarely on pedicels 2.5 mm. long; stamens 16–22; carpels 8–10, all connate.—Illustrated, Bot. Mag. *pl. 4967.*

Cajamarca: Huancabamba, Chota, *Raimondi.* West Indies and Mexico to Peru. "Huailampo."

Phytolacca rivinoides Kunth & Bouché, Ind. Sem. Hort. Berol. 15. 1848; 55.

A scandent or straggling herb, to 5 meters high, the stout branches herbaceous; leaves ovate-acuminate, membranous, often over 10 cm. long and 6 cm. wide, minutely white-punctate; racemes lax, suberect, much exceeding the leaves, to 40 cm. long and 2.5 cm. thick, the peduncles to 5 cm. long; flowers perfect, the slender pedicels to 1 cm. long; sepals broadly elliptic, 2 mm. long; stamens 10–20; carpels 10–16, connate. The leaves and young shoots, cooked, often serve for "greens." Illustrated, Field Mus. Bot. 10: *pl. 35.* Neg. 5717.

Cuzco: Marcapata (*Herrera 1175*).—Huánuco: Hacienda Pampayacu, 1,050 meters, in clearing, *5073*.—Junín: Chanchamayo, *Raimondi; Isern 2368*. Chanchamayo Valley, 1,200–1,500 meters, *Schunke 1473, 1791, 8*. Above San Ramón, 1,500 meters, in forest, *Killip & Smith 24530*. Río Pinedo, 800 meters, in forest, *Killip & Smith 23634*. Puerto Yessup, 400 meters, *Killip & Smith 26287;* petals and anthers white; fruit black. Yapas, 1,500 meters, *Killip & Smith 25477;* fruit purple.—Loreto: Leticia, *Ule 6190*. Pintococha, *Williams 809*. La Victoria, in forest, *Williams 2556*. Puerto Arturo, edge of water, *Williams 5235*. Pongo de Manseriche, 200 meters, on landslides in sun, *Mexia 6231*. Caballo-cocha, *Williams 2495*. Lower Río Nanay, *Williams 436*. Near Iquitos, *Williams 1378, 3710, 1323; Killip & Smith 26991*. Yurimaguas, 200 meters, *Williams 3849*.—Puno: Sangabán, *Raimondi*.—San Martín: Zepelacio, 1,200–1,600 meters, *Klug 3494*. South America to Mexico and the West Indies. "Apacas," "airambo," "jaboncillo," "jaboncillo airambo."

Phytolacca thyrsiflora Fenzl ex J. A. Schmidt in Mart. Fl. Bras. 2: 343. *pl. 80*. 1872; 50.

Allied to *P. rivinoides* but more robust; inflorescence thyrsiform, to 15 cm. long and at the base 2.5 cm. wide, slightly exceeding the leaves; peduncles to 6 cm. long, the pedicels finally 7 mm. long; sepals nearly 3 mm. long; carpels 7–8, connate.

Peru: (*Mathews 3118*). Paraguay; Brazil; Dominican Republic.

Phytolacca Weberbaueri H. Walt. Pflanzenr. IV. 83: 49. 1909.

Similar to *P. dioica*, but so far as known only a shrub, sometimes 6 meters high, with an erect inflorescence much exceeding the leaves or to nearly 30 cm. long; pistillate flowers and fruit unknown. Neg. 5722.

Cajamarca: East of Chepén, 700 meters, *Weberbauer 4817* (type).—Lambayeque: *Raimondi*. "Santo Torne," "yumbi."

10. GALLESIA Casar.

A much branched, often tall tree with ovate-elliptic, coriaceous leaves and ample, axillary and terminal inflorescences of panicled racemes. Flowers perfect, 4-parted, the free sepals erect in fruit. Fruit samara-like.—Kuntze wrote the name *Gallesioa*, the genus being named for Gallesio, an Italian botanist.

Gallesia integrifolia (Spreng.) Harms, Pflanzenfam. ed. 2. 16c: 144. 1934; 84. *Thouinia integrifolia* Spreng. Neue Entdeck. 2: 155.

1821; Syst. 2: 221. 1825. *G. Gorarema* (Vell.) Moq. in DC. Prodr. 13, pt. 2: 8. 1849. *Crataeva Gorarema* Vell. Fl. Flum. Text 1: 200. 1825; Icon. 5: *pl. 4.* 1827.

Leaves very smooth, mostly over 10 cm. long and nearly 5–6 cm. wide, borne on slender petioles; inflorescence 25 cm. long and nearly as broad; sepals enlarged in fruit to 6 mm. long and half as wide; fruit wing about 2 cm. long and 9 mm. broad.—A tree, readily known in flower by its onion-like odor and in fruit by its maple-like seeds; a Brazilian name is "páo d'alho." The leaves are used as soap. Record & Mell, Timbers Trop. Amer. 158, have described the wood, rich in potash (under the name *G. scorododendron* Casar.). Illustrated, Pflanzenreich IV. 83: 84.

San Martín: Tarapoto, *Spruce 4156.*—Río Acre: *Krukoff 5405, 5216.* Brazil.

Gallesia ovata O. C. Schmidt, Repert. Sp. Nov. 32: 97. 1933.

Branchlets and inflorescence more or less tomentose; petioles 3.5–5.5 cm. long; leaf blades ovate, 10–17.5 cm. long, 6–10 cm. wide, rounded at the base, narrowed to the rounded but mucronulate apex, thin, glabrous above, barbate in the 8–9 nerve axils beneath; racemes 12–15 cm. long; flowers 5 mm. long, subsessile, the sepals in fruit to 7 mm. long; fruit wing abruptly dilated from a nearly linear base, to 1.5 cm. long.

Cuzco: Valle de Yanabili, *Raimondi* (type).

11. SEGUIERIA Loefl.

Similar to *Gallesia*, but often shrubby or scandent, and sometimes with tubercle-like stipules. Sepals 5, reflexed in fruit.

Seguieria foliosa Benth. Trans. Linn. Soc. 18: 235. 1839; 93.

A glabrous shrub or tree with slender, chestnut-colored branches; petioles 3 mm. long, with 2 spine-like stipules at the base; leaf blades ovate, gradually acuminate, coriaceous, 2.6 cm. long and nearly half as wide, minutely pellucid-punctate; inflorescence broadly spicate, to 20 mm. long, the branchlets to 4 cm. long; pedicels about 5 mm. long; sepals 4.5 mm. long and 3 mm. broad; fruit wing to 2.5 cm. long and 1.5 cm. broad, the seed-bearing portion with 3 or 4 small wings. Neg. 27745.

Río Acre: *Ule 9487* (det. Schmidt), *9486* (det. Pilger).

Seguieria macrophylla Benth. Trans. Linn. Soc. 18: 235. 1839; 195.

Distinguishable from the preceding by its twice longer petioles, its larger (to 30 cm. long) inflorescence, and especially by its smooth fruits with somewhat narrower wings.

Loreto: Yurimaguas, *Poeppig D2176*. Bolivia.

64. AIZOACEAE. Carpet-weed Family

Well known as is the leafy vegetable New Zealand spinach (*Tetragonia expansa*), established in Peru, which belongs to this family, the group is equally interesting as containing the genus *Mesembryanthemum* sens. lat., which shares with cacti the great popularity among cultivated succulents. In Peru the family is represented only by the following herbs, mostly of sandy places.

Leaves opposite or whorled, at least apparently; calyx free.

Plants finely pubescent with branched hairs.....1. *Glinus*.

Plants glabrous or not as above.

Leaves whorled.....2. *Mollugo*.

Leaves opposite, fleshy.

Stipules present; ovary 1–2-celled.....5. *Trianthema*.

Stipules none; ovary 3–5-celled.....3. *Sesuvium*.

Leaves alternate: calyx tube adnate to the ovary....4. *Tetragonia*.

1. GLINUS L.

Annual or perennial herbs with opposite or whorled leaves and pediceled flowers clustered in the leaf axils. Petals none. Stamens 3–20. Capsule loculicidal. Funicle filiform.—The related *Glischrothamnus Ulei* Pilger, Bot. Jahrb. 40: 396. 1908, of Brazil has closely clustered, subsessile flowers and leaves densely punctate with dark glands.

Glinus radiatus (R. & P.) Rohrb. in Mart. Fl. Bras. 14, pt. 2: 238. 1872. *Mollugo radiata* R. & P. Fl. 1: 48. 1798.

A prostrate or ascending, stellate-pubescent annual; leaves obovate, usually 1–2 cm. long, scarcely acute; flowers densely clustered; sepals 3–4 mm. long, enclosing the capsule; seeds many, lustrous, brown.—Illustrated, Fawcett & Rendle, Fl. Jam. 3: *pl. 59*.

Peru: (Probably). Chile (type locality) to Texas and West Indies.

2. MOLLUGO L. Carpet-weed

Branched annuals with linear leaves in uneven whorls, or the leaves all basal. Sepals 5, the stamens usually of the same number or fewer, rarely more numerous. Capsule loculicidal.

Mollugo verticillata L. Sp. Pl. 89. 1753.

Prostrate, much branched, with usually 5–6 linear-spatulate leaves in each whorl, the longest leaves 2.5 cm. long or sometimes longer; flowers axillary, pediceled, apetalous, 2 mm. long, the sepals slightly exceeded by the capsule; seeds ridged, brown.—Common in temperate and tropical America, often in cultivated places. To be expected is *M. nudicaulis* Lam., the leaves all in a basal tuft, narrowed to a long petiole and about 4 cm. long, the flowers in a long-peduncled cyme.

Arequipa: Near Mejía (*Günther & Buchtien 3*).—Piura: Eleven miles east of Cabo Blanco, *Haught F173*.—Lima: Quive, 1,000 meters, open, rocky slope, *Pennell 14303*. Nearly cosmopolitan.

3. SESUVIUM L.

Perennial strand plants with sessile or shortly pediceled, apparently axillary flowers. Styles and capsule cells usually 3–5, with numerous seeds in each cell.

Sesuvium Portulacastrum L. Syst. ed. 10. 1058. 1759.

Glabrous, the often long stems rooting at the nodes; leaves fleshy, nearly oblong, sessile, 1.5–4 cm. long; flowers 6–10 mm. long, with numerous rose-purple stamens; petals none.—Urban has shown that the flowers are really terminal. Used in Ica in the manufacture of glass and elsewhere in soap making, in place of soda (Ruiz & Pavón). Illustrated, Pflanzenfam. ed. 2. 16c: 229.

Piura: Paita, *Gaudichaud.*—Ica: (*Ruiz & Pavón*).—Lima: Lurín, *Ruiz & Pavón.*—Arequipa: Mollendo (*Weberbauer*, 148). Mejía (*Günther & Buchtien 315, 316*).—Tacna: Arica, *Brenning 141*. On nearly all shores. "Litho."

4. TETRAGONIA L.

Somewhat fleshy herbs or woody-based plants with solitary or few axillary flowers. Petals none. Fruit nut-like, indehiscent, sometimes armed or winged.—Foliage and stems usually more or less whitened by spiculate, glistening scales or pubescence.

A shrub or half-shrub with narrow leaves.....*T. maritima.*

Annual or perennial herbs, little or not at all woody below.

Leaves oblong, oblong-linear, or narrowly obovate.

Flowers distinctly pediceled.....*T. pedunculata.*

Flowers sessile.....*T. macrocarpa.*

Leaves ovate to suborbicular.

Plants perennial, the greenish leaves often 5 cm. wide. *T. expansa.*

Plants annual, the often whitish leaves smaller.

Fruit quadrangulately lobed, beaked, 4-celled. . *T. crystallina.*

Fruit globose, somewhat quadrate in drying. . . . . *T. ovata.*

Fruit obscurely 4-angled, 5–7-celled. . . . . *T. vestita.*

Tetragonia crystallina L'Hér. Nov. Hist. 81. *pl. 39.* 1784.

Openly branched, 10–30 cm. high; leaves sessile, ovate, acute, crystalline-papillose, narrowed to the apex, 4–6 cm. long, 2–3 cm. wide; flowers solitary or rarely binate, subsessile, 8 mm. wide, in fruit pedicellate, the ovate-acute divisions spreading, crystalline-papillose without; filaments 16, yellow; styles 4; fruit 4-angulately lobed, beaked.

Lima: Chancai (*Dombey*). Lima, *Abadía.* Chorrillos, loose, stony, upper slopes of seaside hills, 150 meters, *5855.*

Tetragonia expansa Murr. Comment. Gött. 6: 13. 1785. *Demidovia tetragonoides* Pall. Hort. Demid. 150. *pl. 1.* 1781. *T. tetragonoides* Kuntze, Rev. Gen. 1: 264. 1891.

A nearly smooth, coarse, subprostrate perennial with rhombic-ovate, petioled leaves 2.5–8 cm. long; flowers solitary, axillary, 5–6 mm. wide, the 4-knobbed, subsessile fruit about 1 cm. thick.—The earliest name if validly published (publication not seen) is *T. tetragonoides* (Pall.) Kuntze, but in any case this binomial, from an intelligent if not from an academic standpoint, merely repeats the generic name and therefore its use is contrary to the International Rules. The leaves, cooked, are used as "greens." Illustrated, Pflanzenfam. ed. 2. 16c: 233.

Arequipa: Mejía (*Günther & Buchtien 317;* det. Bruns). Widely distributed and cultivated. "New Zealand spinach."

Tetragonia macrocarpa Phil. Fl. Atac. 19. 1860; Viaje Des. Atac. 12, 193. 1860.

More or less spiculate-villous, to 10 cm. high, usually lower, branching, mostly horizontally, from the base; leaves oblong-obovate, obtuse, 1–2 cm. long, narrowed to the sessile base; flowers solitary, sessile; ovary 4–6-celled; fruit sessile or short-pediceled, angled with 4–6 ridges, these sometimes nearly wing-like, to 1 cm. long.

Tacna: At 650 meters, *Werdermann 721.* Chile. "Pasto aguanoso."

Tetragonia maritima Barnh. in Gay, Fl. Chile 2: 469. 1846.

A dioecious, stoutly branched, spiculate-villose shrub; leaves oblong-lanceolate, obtuse, attenuate basally to a short petiole; flowers solitary, short-pediceled, the staminate with a rudimentary ovary; stamens 15; styles papillose; fruit 3-celled, longitudinally 3-winged.—According to Johnston, a dense bush 30–120 cm. high with yellowish green, succulent foliage. Allied to *T. angustifolia* Barnh., with oblong-linear leaves, 15–20 stamens, the 3–4-celled fruit 4-winged.

Tacna: Arica, *Ball.*—Arequipa: Mejía, *Günther & Buchtien 313, 314, 318* (det. Bruns). Chile.

Tetragonia ovata Phil. Anal. Univ. Chile 85: 168. 1893.

A small annual with crowded, elongate, ovate leaves about 3 cm. long, gray-green with papillose-spiculate pubescence; flowers yellow, short-pediceled; fruit prismatic, 4-ridged or angled.—Johnston describes the plant as "usually with widely spreading branches, the fruit subglobose, red, juicy, only somewhat 4-angled in drying."

Tacna: At 800 meters, *Werdermann* 725 (det. Werdermann as aff.). Cachendo, *Günther & Buchtien 319* (det. Bruns).—Moquehua: Mountains between Moquehua and Torata, 2,000 meters, *Weberbauer 7422.* Chile.

Tetragonia pedunculata Phil. Anal. Univ. Chile 717. 1872.

Low, densely long-spiculate-villose; leaves oblong-linear; flowers distinctly pediceled, the pedicels becoming 1–1.5 cm. long; fruit 5–6-celled, pyramidal-prismatic, the 4–6 ridges united at the base.

Tacna: *Woitschach* in 1891.—Lima: San Agustín, *Weberbauer 4.* Chile. "Lechuga."

Tetragonia vestita I. M. Johnston, Contr. Gray Herb. 81: 88. 1928.

An annual herb 5–15 cm. high, the few branches ascending in part; leaves ovate or oblong-ovate, 2.5 cm. long, 1.5–3 cm. broad, crystalline-papillose and more or less villous; calyx 4–5 mm. long, the petal-like lobes obtuse, yellowish; stamens 15–20; stigmas 5–7, the ovary with as many cells and seeds, the fruit usually about 6 mm. long; ovary very densely villous with subulate or conic, 1-celled trichomes.

Arequipa: Just below the fertile belt on hill back of Mollendo, *Johnston 3533; (Weberbauer 144?).*

5. TRIANTHEMA L.

The genus is represented in America by a single species.

Trianthema Portulacastrum L. Sp. Pl. 223. 1753. *T. monanthogyna* L. Mant. 1: 69. 1767.

An erect or ascending, glabrous annual, the leaves rounded-obovate, fleshy, bright green; calyx 5-parted, colored within; stamens 6–10; style 1.

Piura: La Brea, 150 meters, *Weberbauer 7764;* flowers rose-colored. Pariñas Valley, *Haught 268;* flowers rose. Negritos, *Haught F84.* Eight miles northeast of Cape Pariñas, *Haught 173.* Widely distributed in the warmer parts of America.

65. PORTULACACEAE. Purslane Family

Apart from the curiously long-hairy Portulacas, the Calandrinias are the most interesting Peruvian purslanes because of their variety and their often pretty, flax-like blossoms.

Flowers not glomerulate and scarious-bracted.

Capsule circumscissile, adnate below to the calyx tube; plants usually pilose, especially in the leaf axils.....1. *Portulaca.*

Capsule valvate, (like the ovary) entirely free; plants not characteristically pilose.

Petals distinct; seeds usually many.

Sepals usually caducous; seeds smooth; inflorescence ample. 2. *Talinum.*

Sepals persistent; seeds usually rough; inflorescence often small.....3. *Calandrinia.*

Petals united below; seeds few; a small annual of wet places. 4. *Montia.*

Flowers glomerulate in the axils of colored, scarious bracts. 5. *Phillippiamra.*

1. PORTULACA L.

Somewhat fleshy, annual or perennial herbs, decumbent, ascending, or erect, commonly with the flowers and fruits involved in long, white or brownish hairs. Uppermost leaves forming an involucre around the sessile flowers. Calyx deciduous. Ovary partially inferior. Capsule circumscissile.—*P. grandiflora* Hook., with very large and showy flowers of various colors, native of Brazil and Argentina, often is grown for ornament. The local name is "flor

de las once." Since the preparation of this account, Karl von Poellnitz has published a revision of the genus, Repert. Sp. Nov. 37: 240–320. 1934. Unfortunately, he treats only those species accepted as valid, and with specimens of the Peruvian plants no longer available to me it has been impossible to place them in his treatment or to give them their correct nomenclature.

Plants inordinately soft-pilose, the minute, crowded leaves hidden. *P. pilosissima.*

Plants more or less pilose or glabrous, the leaves not minute.

Plants distinctly perennial, with thick caudex and stems.

Pubescence short, soft; seeds black, radiately stellate-tuberculate..... *P. peruviana.*

Pubescence long or stiff; seeds tardily red-black, tuberculate. *P. lanuginosa.*

Plants evidently annual or the stems not thick or much branched.

Leaves terete or narrowly linear.

Seeds not or scarcely metallic-lustrous, more or less stellate-tuberculate; plants usually branching.

Flowers typically red-purple; seeds black, stellate-tuberculate..... *P. pilosa.*

Flowers yellow; seeds red-brown, tuberculate, faintly stellate..... *P. Haughtii.*

Seeds strongly metallic-lustrous, finely tuberculate; plants simple or nearly so..... *P. amboensis.*

Leaves flat, oblong-lanceolate.

Plants glabrous..... *P. oleracea.*

Plants pilose.

Involucral leaves few; seeds metallic-lustrous, stellate-tuberculate..... *P. tingoensis.*

Involucral leaves many; seeds black, tuberculate. *P. rubricaulis.*

Portulaca amboensis Macbr. Candollea 5: 350. 1934.

Similar to *P. tingoensis* but the leaves terete, as many flowers axillary as terminal or more, and the stems not enlarged above; seeds distinctly purple-opalescent, 0.5 mm. broad.—The 3–4 linear-terete leaves subtending the terminal flower cluster are no larger (8–15 mm. long) than the promptly deciduous cauline leaves. Stems simple or rarely with one or two branches. Growing on stony river flats.

Huánuco: Ambo, 2,100 meters, *Macbride 3202* (type). Huánuco, *Ruiz & Pavón.*

Portulaca Haughtii Macbr. Field Mus. Bot. 11: 21. 1931.

A slender annual with few to many loosely spreading branches; stems moderately white-pilose in the axils, the hairs about 5 mm. long; leaves alternate, perhaps subterete, narrowly linear, 1–1.5 cm. long, those of the stem scarcely crowded or caducous; hairs about 4 mm. long, only partially concealing the flowers and capsules; stamens about 10; style 4-parted; capsule circumscissile about the middle; seeds acutely and finely tuberculate, the tubercles scarcely manifestly stellate basally, reddish brown.—Named for Mr. Oscar Haught, who made a nearly complete collection of the plants of Piura.

Piura: High plain near Pariñas Valley, *Haught F180*, type.

Portulaca lanuginosa HBK. Nov. Gen. & Sp. 6: 74. 1823.

Stems procumbent, branching, with short to very long but always firm hairs in the axils; leaves 5–7 mm. long, approximate, fleshy, terete, blunt; stamens 16–25; styles 3–7; capsule circumscissile below the middle; seeds tuberculate, tardily red-black and somewhat opalescent.—A coarse perennial with typically yellow flowers, but in my material (possibly referable to *P. peruviana*) these red-purple. Poellnitz, op. cit. 262, thinks the HBK. plant belongs to the *P. pilosa* complex, following Rohrbach in Mart. Fl. Bras. 14, pt. 2: 304. 1872, who treats it as a race with short, obtuse leaves; supposedly the same plant has received the name *P. pilosa* var. *eriocarpa* (Casar.) Hauman. Probably, too, the HBK. name is not tenable; *P. lanuginosa* Crantz, Inst. 2: 428. 1778, was not cited by HBK. but it has been referred here.

On the Marañón (*Humboldt*, type).—Amazonas: Balsas, *Weberbauer 4266;* 156.—Huánuco: Stony river flat, Ambo, 2,100 meters, *3201;* flowers red-purple.—Junín: Tarma, *Weberbauer 2367.*

Portulaca oleracea L. Sp. Pl. 445. 1753.

Plants annual, very fleshy, prostrate, glabrous; leaves cuneate-obovate; flowers small, yellow, sessile in the leaf axils; capsule circumscissile.

Cuzco: Valle del Urubamba, Machupicchu, 2,200 meters, *Herrera 3235.*—Huánuco: Huánuco, along road, 2,100 meters, *3537.*—Loreto: Río Putumayo, in clearing, *Klug 1620.* Puerto Arturo, 200 meters, in pasture, *Williams 5033.* Fortaleza, 200 meters, *Williams 4365.* Pisco, *Williams 1283.* Río Masana, *Williams 244.* A species of cosmopolitan distribution. "Verdolaga."

Portulaca peruviana I. M. Johnston, Contr. Gray Herb. 81: 88. 1928.

A perennial, fleshy, much branched at the base, with often numerous stems a few to many cm. high; axil pubescence short and dense or even lacking; leaves alternate, 5–10 mm. long, linear-spatulate, many of them persistent, the shorter involucral ones scarcely exceeding the purple flowers or the capsules; capsule dehiscent near or toward the base; seeds black, little lustrous, radiately stellate-tuberculate.—Open, rocky slopes. Perhaps not distinct from *P. lanuginosa*, unless in the shorter pubescence.

Arequipa: Tingo, 2,200 meters, *Pennell 13140* (type); *Stübel 81*. Mt. Chachani, 3,000 meters, sandy pampa, *Hinkley 1*.—Moquehua: Carumas, 2,700 meters, *Weberbauer 7278*.—Lima: Prostrate on granitic slopes, Matucana, 2,400 meters, *278; Weberbauer 90, 90a, 163, 166*. San Bartolomé, *Weberbauer 5281*.—Ancash: Near Huaraz, *Raimondi*. "Verdolaga."

Portulaca Philippii I. M. Johnston Contr. Gray Herb. 85: 39. 1929.

A fleshy perennial, often ligneous below, the branches 5–15 cm. long, procumbent or ascending, usually branched; leaves alternate, numerous, suberect, 5–8 mm. long, 1.5–2.5 mm. broad, persistent; axillary hairs moderately long; flowers solitary or 2–3, the triangular, ovate, acute involucral leaves about 4 mm. long; sepals ovate, 8 mm. long; stamens 25–35; capsule stipitate, circumscissile below the middle; seeds opaque, 0.5 mm. wide, blackish, minutely tuberculate-stellate.

Puno: Lake Titicaca (*Pentland*). Bolivia; Chile.

Portulaca pilosa L. Sp. Pl. 445. 1753.

An ascending-erect annual, more or less conspicuously pubescent in the leaf axils; leaves narrowly linear, acute, to 1.5 cm. long, alternate; flowers typically red or purple, to a few mm. long, the subtending leaves 2–3 mm. long, involved in long hairs; stamens 15 or more; styles 3–6; capsule circumscissile about the middle; seeds 0.5 mm. wide, minutely tuberculate, each obtuse (or acute?) cone star-like at the base.—Urban's interpretation of this species, Symb. Antill. 5: 343. *f. A–B.* 1907, is accepted here. Possibly the following Peruvian material (not studied by me) is referable to other species, very probably at least in part. Tessmann found the species growing near houses, the leaves rubbed on the hair to "smooth" it and, "das Kinder gut gehen," on their knees.

Loreto: Yarina-cocha, *Tessmann 5484.* Pinto-cocha, *Williams 815, 1278.* Iquitos, *Williams 7939.* Leticia, *Williams 3028.*—Cuzco: Valle del Vilcanota, 3,550 meters (*Hicken*). Ollantaitambo, 2,800 meters, *Herrera 627.*—Arequipa: Mollendo (*Günther & Buchtien 1679,* fide Bruns). South America to the United States. "Flor de seda," "flor de las once," "bustirao chama."

Portulaca pilosissima Hook. Bot. Misc. 2: 220. 1831.

Inordinately and softly white-pilose, the small, terete leaves and flowers concealed in the long, rusty pubescence; stems decumbent, branched.—Characteristically a much branched, matted perennial. Poellnitz, op. cit. 261, treats it as a form of *P. pilosa.*

Lima: Yazo, Valley of Canta (*Cruckshank*).—Tacna: *Woitschach.* —Arequipa: Mollendo, *Weberbauer 1483;* 144. Mejía (*Günther & Buchtien 303, 304*).

Portulaca rubricaulis HBK. Nov. Gen. & Sp. 6: 73. 1823.

A well marked species, at least in Peru, by its flat leaves about 1 cm. long and 3–4 mm. wide, its glabrous stems (but the soft leaf axil pubescence sometimes so long that it reaches from leaf node to leaf node!), and its 6–9 involucral leaves; flowers purple, usually several and terminally congested; capsule about medially circumscissile; seeds black, lustrous, tuberculate.—The stems are often branched but mostly only above the base. Our material has somewhat shorter leaves than those of the type. Poellnitz refers the HBK. plant to *P. pilosa* with a query; very possibly the Peruvian collections were misdetermined. The type is from Venezuela.

San Martín: Tarapoto, *Williams 5686, 5787.*

Portulaca tingoensis Macbr. Field Mus. Bot. 11: 21. 1931.

A few cm. high or rarely higher, simple or branching near the base, the stems or branches strongly enlarged toward the tips; leaves alternate, caducous, apparently flat, oblong-spatulate, about 1 cm. long, the involucral few; inflorescence densely involved in hairs 5–7 mm. long; capsules sometimes axillary, solitary, circumscissile below the middle; seeds iridescent, bluntly tuberculate, the scales radiate at the base, nearly 0.6 mm. broad.—Flowers unknown. This may prove to be referable to *P. simpliciuscula* Mart., with shorter pubescence and eradiate scales.

Arequipa: Open, rocky and sandy slopes in early April, Tingo, 2,200 meters, *Pennell 13111* (type).

2. TALINUM Adans.

Glabrous, often slender herbs with flat leaves and generally an amply racemose or paniculate inflorescence. Sepals promptly or tardily deciduous. Ovary free. Capsule 3-valved.

Flowers 5 mm. long or shorter, paniculate.....*T. paniculatum.*

Flowers 6 mm. long or longer, usually racemose.....*T. triangulare.*

Talinum paniculatum (Jacq.) Gaertn. Fruct. 2: 219. 1791. *Portulaca paniculata* Jacq. Enum. 22. 1760. *P. patens* Jacq. Hort. Vind. 2: 71. 1772. *T. patens* Willd. Sp. Pl. 2: 863. 1800. *T. reflexum* Cav. Icon. 1: 1. *pl. 1.* 1791. *T. dichotomum* R. & P. Syst. 118. 1798.

Often fleshy-suffrutescent at the base and several dm. high; leaves more or less obovate and somewhat petiolate, usually 5–10 cm. long; pedicels terete, filiform; flowers rose, flesh-colored, or yellow; stamens 15–20.—Illustrated, Fawc. & Rendle, Fl. Jamaica 3, pt. 1: 171. 1914.

Junín: La Merced, 700 meters, *Killip & Smith 23721.*—Loreto: Fortaleza, 200 meters, in pasture, *Williams 4409.* Yurimaguas, 200 meters, in pasture, *Williams 3955.* Puerto Arturo, 200 meters, *Williams 5105.*—Huánuco: Posuso, *Esposto* (det. Ulbrich). Huánuco, *Ruiz & Pavón.* Huánuco, 2,100 meters, loose soil on cliffs, *3257.*—Lima: Chancai (*Ruiz & Pavón*). San Bartolomé, *Weberbauer 5307* (det. Ulbrich).—San Martín: San Roque, 1,400 meters, *Williams 7364.* Tarapoto, *Ule 6338; Williams 5593.*—Túmbez: East of Hacienda Chicama, 1,000 meters, *Weberbauer 7652.*—Without locality: *Weberbauer 6463.* South America to the southern United States. "Cuchi-yuya," "sacha-culantro," "cuchi-yuyu."

Talinum triangulare (Jacq.) Willd. Sp. Pl. 2: 862. 1800. *Portulaca triangularis* Jacq. Enum. Pl. Carib. 22. 1760. *P. racemosa* L. Sp. Pl. ed. 2. 640. 1762. *T. crassifolium* Willd. Sp. Pl. 2: 862. 1800(?).

Similar to *T. paniculatum* but the pedicels 3-angled and the stamens often more numerous.—Flowers sometimes white. The plant is sometimes cooked and eaten as a vegetable.

Piura: Chanso, *Weberbauer 5998* (det. Ulbrich).—Túmbez: Hacienda Ciénaga, 250 meters, *Weberbauer 7629.*—San Martín: Tarapoto, *Ule 6334; Williams 5728.* Widely distributed in tropical America.

3. CALANDRINIA HBK.

Cosmia Domb. ex Juss. Gen. 312. 1789; *Baitaria* R. & P. Prodr. 63. *pl. 36*. 1794.

Low herbs, rarely acaulescent, with axillary flowers, or more frequently the flowers in racemes or panicles terminating the often leafless stems. Leaves mostly crowded toward the base of the plant. Stamens few to many, variable in number in the same species. Sepals more or less enclosing the mature capsule. Seeds usually puncticulate.—Kuntze, Rev. Gen. 1: 14. 1893, referred the genus to *Claytonia* Gronov. The generic name of HBK. has been conserved. The fleshy leaves are used as an emollient.

Plants caulescent, the stems sometimes short, particularly in *C. ciliata*.
- Flowers several to many, terminal; stamens usually more than 10.
  - Leaves, at least the lower, subrotund-obovate, often several cm. wide.
    - Petals entire.
      - Capsule little exserted; seeds sparsely hispid....*C. Ruizii*.
      - Capsule well exserted; seeds densely hispidulous. *C. paniculata*.
    - Petals crenate.....*C. crenata*.
  - Leaves linear to narrowly obovate, few if any of them more than 1 cm. wide.
    - Leaves oblong-obovate, all or most of them 6–10 mm. wide. *C. pachypoda*.
    - Leaves linear-oblanceolate, 2–4 mm. wide or rarely wider.
      - Plants annual or biennial; leaves often 3–5 cm. long.
        - Capsule little if at all exceeding the sepals.
          - Flowers usually umbellate-fasciculate; capsule a little exserted.....*C. Weberbaueri*.
          - Flowers racemose or paniculate; capsule and sepals subequal.....*C. lingulata*.
        - Capsule twice as long as the sepals.....*C. quivensis*.
      - Plants perennial; leaves 2–2.5 cm. long.....*C. linomimeta*.
- Flowers solitary, axillary; stamens often fewer than 10.
  - Seeds scarcely lustrous, distinctly puncticulate; leaves obovate. *C. alba*.
  - Seeds very lustrous, not strongly punctate; leaves nearly linear. *C. ciliata*.

Plants acaulescent, perennial, with a fusiform root.....*C. acaulis*.

Calandrinia acaulis HBK. Nov. Gen. & Sp. 6: 78. 1823.

A tufted, little perennial with solitary, white, or later roseate flowers more or less hidden in the numerous elongate, linear leaves; pedicels a few mm. to 2 cm. long, recurving in fruit; leaves 2–4 mm. wide, 1 to several cm. long, glabrous; flowers 1 cm. long or smaller or, in var. *magna* Macbr. (Candollea 5: 350. 1934), over 2 cm. long; stamens few; capsule elliptic, included; seeds roundish-ovate, very minutely puncticulate, the puncticulations scarcely discernible under magnification less than 10.—Sandy or stony soils. "Usually on the puna to 3,200 meters" (Weberbauer 88, 196, 211). The Lechler specimen, distributed under a new name by Barneoud, seems to be referable here.

Arequipa: Open, sandy places along streams, Nevado de Chachani, 3,800 meters, *Pennell 13274.*—Puno: Agapata, *Lechler 2672.* Sandía region, *Weberbauer 956;* 219.—Lima: Canta, *Ruiz & Pavón.* Viso, 2,700 meters, *622, 606* (var. *magna*). Above Lima, *Weberbauer 169.*—Junín: Near Yauli, *Weberbauer 380;* 221. Río Blanco, 4,500 meters, *2981.* Near Oroya, *Weberbauer 232;* 223.—Ancash: Ocros, *Weberbauer 2671.*—Huánuco: Mito, 2,700 meters, *1946.*—Cuzco: Valle del Paucartambo, Hacienda Lauramarca, 2,600 meters, *Herrera 2339.* "Thurpa."

Calandrinia alba (R. & P.) DC. Prodr. 3: 359. 1828. *Talinum album* R. & P. Syst. 1: 116. 1798. *Claytonia alba* Kuntze, Rev. Gen. 1: 14. 1891.

Glabrous, with slender, often elongate stems and rather remote, lance-spatulate leaves to 3.5 cm. long and 8 mm. broad, strongly narrowed to a petiole-like base about 1 cm. long, rounded to an acutish apex; pedicels in fruit 8 mm. long; capsule exserted about 1 mm.; seeds nearly round, very turgid, scarcely lustrous, distinctly puncticulate, nearly 1 mm. wide.—The flowers of the original collection seen by me are undeveloped; in the Weberbauer material (det. Berlin) they are purple, in mine white. Stony places. Neg. 8434.

Lima: Chancai, *Ruiz & Pavón.* San Gerónimo, 150 meters, *5908.*—Arequipa: Mollendo, *Weberbauer 1509.* Mejía, 200 meters (*Günther & Buchtien 306,* fide Bruns); also at 1,000 meters, at Cachendo.

Calandrinia ciliata (R. & P.) DC. Prodr. 3: 359. 1828. *Talinum ciliatum* R. & P. Syst. 1: 116. 1798. *C. caulescens* HBK. Nov. Gen. & Sp. 6: 78. *pl. 526.* 1823. *Talinum caulescens* Spreng. Syst. 2: 453.

1825. *Phacosperma peruviana* Haw. Phil. Mag. 1: 124. 1827(?). *C. Phacosperma* DC. loc. cit.

A little annual, at first cespitose-tufted, the stems in fruit developing to several cm. long; leaves linear-spatulate, to about 3 cm. long, often glabrous; flowers purple, or white fading to purple, subsessile or pediceled, solitary, axillary; capsule scarcely exserted; seeds turgid-lenticular, with a thin margin, lustrous, scarcely prominently puncticulate.—The leaves of the type at Madrid are essentially glabrous, the few cilia being obscure, or lacking on some leaves. The original description reads: Herb to about 30 cm. high: leaves linear-oblong, ciliate; flowers solitary. Neg. 8433.

Arequipa: Open gravel on rocky slopes, 4,000 meters, Nevado de Chachani, *Pennell 13277*. Mollendo, *Johnston 3546* (det. Johnston as *C. caulescens*).—Moquehua: Torata, 2,700 meters, *Weberbauer 7415*.—Lima: Baños and Obrajillo (*Wilkes Exped.*). Viso, 2,700 meters, *598*.—Junín: Huasa-huasi, *Ruiz & Pavón; Dombey*. Near Oroya, *Ball*.—Huánuco: Mito, 2,700 meters, *1719*.—Cajamarca: Cutervo, *Jelski 245*.

Calandrinia crenata (R. & P.) Macbr. Field Mus. Bot. 11: 20. 1931. *Talinum crenatum* R. & P. Syst. 115. 1798.

An herb 30 cm. high with subrotund-obovate, acuminate leaves and racemose flowers with crenulate petals.—Apparently unknown, there being no specimens at Madrid, and perhaps not distinct from *C. Ruizii*. Its characters may be proved or disproved by exploration.

Arequipa: On the hills about Pongo, Atiquipa, April-September (*Ruiz & Pavón*). "Lengua de vaca."

Calandrinia lingulata (R. & P.) DC. Prodr. 3: 358. 1828. *Talinum lingulatum* R. & P. Syst. 115. 1798.

An herb about 20 cm. high, branching from the base, with glabrous, lingulate leaves 2–3 (–4) mm. wide; racemes crowded; bracts 2 mm. long; stamens 10–15; pedicels ascending, 5–10 mm. long; sepals 3–4 mm. long; capsule finally about 5 mm. long.—There is only one capsule on the Madrid specimen, but this seems to be well exserted. One sheet of *T. ciliatum*, as labeled in Herb. Boiss., is evidently the same as the type at Madrid of *T. lingulatum*. Neg. 8435.

Lima: In sands, Chancai at Jequán, *Ruiz & Pavón; Dombey*.

Calandrinia linomimeta Diels, Bot. Jahrb. 37: 400. 1906.

Suffrutescent below, with strict, herbaceous branches 10 cm. tall or taller that are leafless above and often forked at the racemose

inflorescence of showy, roseate flowers; leaves crowded, oblanceolate, mucronulate; pedicels in fruit 1–1.5 cm. long, recurved; petals 1.5 cm. long; stamens many; stigmas 3-parted; capsules almost bright yellow, 6–7 mm. long, 5 mm. thick; seeds estrophiolate, lustrous, smooth.—As the author notes, suggestive of *Linum*. Neg. 27676.

Amazonas: Prov. Luya, stony slopes, 900 meters (*Weberbauer 4788;* 155).

Calandrinia pachypoda Diels, Bot. Jahrb. 37: 399. 1906.

A fleshy perennial with very thick, branching, procumbent stems and densely leafy, ascending flowering branches about 10 cm. high; leaves 1.5–3 cm. long, 6–10 mm. wide, narrowed to a petiole-like base, scarcely acute but often apiculate; flowers 3 or 4, white, about 1 cm. long; sepals acuminate, half as long; stamens many; seeds distinctly muriculate, minutely strophiolate.—Suggests *Talinum crassifolium* Willd. (type poor), but the leaves are narrower. Stony slopes. Neg. 27678.

Cajamarca: East of Chepén, 800 meters, *Weberbauer 4816* (type); 153.—Junín: *Weberbauer 5280*(?).—Lima: Chosica, 900 meters, *493, 2875.*

Calandrinia paniculata (R. & P.) DC. Prodr. 3: 358. 1828. *Talinum paniculatum* R. & P. Syst. 114. 1798. *C. adenosperma* I. M. Johnston, Contr. Gray Herb. 81: 89. 1928.

A stout, glabrous, glaucous perennial, sometimes over 40 cm. high; leaves obovate-oblong, acuminate, fleshy, the largest 10 cm. long and 6 cm. wide; flowers racemose, the pedicels 3–7 times longer than the conspicuous bracts; sepals suborbicular, 8–10 mm. long; petals red, to about 1 cm. long, capsule longer than the calyx; seeds black, opaque, densely hispidulous or glandular-echinate.—Very near *C. grandiflora* Lindl., typically, at least, with larger flowers, smaller bracts, and eglandular seeds; but *Esposto 16* had yellow flowers 2.5 cm. wide. Neg. 29565.

Arequipa: Pongo, Atiquipa (*Ruiz & Pavón*). Chachani, 2,700 meters, *Hinkley 35,* type of *C. adenosperma.* Cerros de Caracoles, *Esposto 16.*—Arequipa: *Hopp 6.* Mt. Chacani, 2,745 meters, *Hinkley 35.*—Lima: Lomas at Chancai, *Ruiz & Pavón* (type); *Dombey.* "Oreja de perro," "castañuela," "lloto del cerro."

Calandrinia quivensis Macbr. Field Mus. Bot. 11: 21. 1931.

An annual or biennial, strictly erect and more or less branched above the base, several dm. high; leaves crowded, linear, to about

4 cm. long, 2–3 mm. wide; racemes often branching; pedicels spreading in fruit, 5–7 mm. long; petals purple, 5 mm. long; sepals orbicular, 2.5 mm. long, the capsule nearly twice as long; seeds opaque, muriculate, minutely strophiolate.—Very possibly this is well developed, mature material of *C. lingulata*.

Lima: Open, rocky slope, 900 meters, Quive, *Pennell 14299* (type). Chorrillos, 150 meters, *5850*.

Calandrinia Ruizii Macbr. Field Mus. Bot. 11: 20. 1931. *Talinum polyandrum* R. & P. Syst. 115. 1798, not *C. polyandra* Benth.

Stems ascending-decumbent below and there clothed with broadly obovate or subrotund leaves, originally described as "acuminate" but, so far as seen, merely apiculate; flowers pink, racemose; pedicels finally becoming several cm. long; stamens many; petals obcordate, entire, less than 1 cm. long; capsule a little exserted; seeds black, minutely and sparsely white-hispid.—Very fleshy plants of disintegrating rocky slopes, sometimes 30 cm. high. Type not seen; Weberbauer specimens determined at Berlin.

Arequipa: Lomas near Pongo (*Ruiz & Pavón*). Mollendo, *Weberbauer 1484;* 144.—Tacna: *Woitschach.*—Lima: Barranco, *Weberbauer 1598;* 144. Chorrillos, 150 meters, *5849*. Matucana, 2,400 meters, *432*.

Calandrinia Weberbaueri Diels, Bot. Jahrb. 37: 399. 1906.

Annual or biennial, much branched at the base, the ascending or erect stems a few cm. to several dm. high; flowering branches leafless; pedicels slender, 5–8 mm. long; sepals 3 mm. long; petals purple; capsule 4 mm. long.—Nearly *C. lingulata*, except for the crowded, almost umbellate flowers.

Arequipa: In sand, Mollendo, *Weberbauer 1507* (type).—Moquehua: Between Moquehua and Torata, 2,000 meters, *Weberbauer 7432*.—Lima: Below Cocachachua, *Weberbauer 5269*. Near Chosica, 1,000 meters, *Weberbauer 5221* (leaves broader).

4. MONTIA L.

Reference: Briquet, Prodr. Fl. Cors. 1: 474–476. 1910.

Our species a small, ascending or procumbent, sometimes tufted, branching annual (or rarely more enduring) with opposite leaves and axillary or terminal, few-flowered racemes of tiny flowers. Petals white, unequal, connate at the base but the tube open on one side. Seeds few.—The rather similar *Monocosmia monandra* (R. & P.) Pax is Chilean, not Peruvian, as has been sometimes indicated. Urban observed the remarkable ejection of the seeds: the three capsule segments upon opening at once curl up from beneath, thus

pressing together and raising the seeds which are ordinarily thrown 50–80 cm., or even as far as 2 meters and as high as 60 cm.

Montia fontana L. Sp. Pl. 87. 1753.

Leaves obovate to narrowly spatulate, from minute to 12 mm. long, with a petiole-like base; calyx scarcely 2 mm. long, the petals little longer, the globose pod included.—There are two or three forms of which only one, var. *repens* Pers. Syn. 1: 111. 1805 (*M. rivularis* Gmel. Fl. Bad. 1: 301. 1805), has apparently been found in Peru. It has somewhat lustrous seeds with tubercles developed in varying manner and degree. Also to be expected is var. *erecta* Pers. (*M. minor* Gmel.) with dull, lineately muricate seeds. In water or very wet places in cool regions of the world.

Puno: Sachapata, *Lechler 2688.*—Huánuco: Six miles south of Mito, 3,150 meters, in bog, *1831.* Tambo de Vaca, 3,900 meters, edge of forest, *4402.*—Cuzco: Paso de Tres Cruces, 3,700 meters, streamlet in paramo valley, *Pennell 13908;* an aquatic herb; petals white. La Raya, 4,500 meters, in *Distichia* cushions, *Pennell 13499* (var. *repens*).

5. PHILIPPIAMRA Kuntze

Silvaea Phil. Fl. Atac. 21. *pl. 1, f. C.* 1860, not H. & A. 1836.

A widely branching herb with small flowers crowded in apical inflorescences. Involucral leaves persistent. Sepals 3–4. Stamen 1. Style 2-toothed. Fruit not splitting explosively nor irregularly dehiscent, with 1 seed.

Philippiamra pachyphylla (Phil.) Kuntze, Rev. Gen. 1: 58. 1891. *Silvaea pachyphylla* Phil. loc. cit.; Viaje Des. Atac. 38, 195. 1860.

Well marked by the nearly bushy habit and the conspicuous, scarious bracts, often tinted, about the glomerulate flowers.—There are several closely related species in northern Chile to be expected, which, however, Johnston (Contr. Gray Herb. 85: 39. 1929) thinks are probably all forms of one species. The leaves are sometimes nearly amplexicaul, sometimes petioled.

Tacna: *Werdermann 231* (det. Werdermann). Chile.

66. BASELLACEAE. Basella Family

Reference: Ulbrich, Pflanzenfam. ed. 2. 16c: 262–271. 1934.

These low, glabrous, somewhat twining plants with rather fleshy, obovate leaves and axillary spikes or racemes of tiny flowers, are

important in Peru as furnishing the tubers called "ullucos," commonly cultivated and eaten like potatoes. The remains of them have been found, apparently, in old Peruvian graves (Harms).

Flowers sessile; filaments straight; petals not caudate. . . 1. *Basella.*
Flowers pedicellate (Peruvian forms); filaments curved or the petals caudate.

Filaments in bud straight; petals tailed; bractlets prominent. 2. *Ullucus.*

Filaments in bud curved; petals blunt or not tailed.

Floral bractlets not dorsally winged in fruit. . 3. *Boussingaultia.*

Floral bractlets with a wide, fin-like wing in fruit. . 4. *Anredera.*

1. BASELLA L.

Succulent, branching, twining herbs with spikes of tiny, tubular, white, reddish, or purplish flowers. Bracts minute, caducous. Calyx lobes 2. Anthers extrorse.

Basella alba L. Sp. Pl. 272. 1753. *B. rubra* L. loc. cit.

Often 1 meter long; leaves sometimes nearly round, several cm. to 15 cm. long, brittle when fresh; corolla lobes 2 mm. long, obtuse; fruit red, black, or white.—*B. rubra,* according to Ulbrich, is only the more or less reddish-colored race of this variable plant, which has been in cultivation since 1688 and is used as a vegetable or salad. —Illustrated, Pflanzenfam. ed. 2. 16b: 267.

Lima: Matucana, *Weberbauer 5274* (det. Ulbrich); at 2,400 meters, trailing over rocks, *166.* Viso, *Weberbauer 156* (det. Ulbrich). Chorrillos, 150 meters, stony slopes, seaside hills, *5851.*—Junín: Tarma, 3,100 meters, open hillside, *Killip & Smith 21815.*—Arequipa: *Hopp* (det. Ulbrich). Arequipa, 2,800 meters, open, rocky slopes, *Pennell 13248.*—Moquehua: *Raimondi.* Native of Asia or Africa, widely established after cultivation.

2. ULLUCUS Lozano

An herb with potato-like tubers, at first erect but soon sprawling and somewhat twining, succulent. Perianth parts spreading, narrowed abruptly from an oval base to an elongate, nearly linear, appendage-like tip. Anthers dehiscent apically.—Important as a food plant. In the cultivated form almost bushy in habit. The tubers attain the size of small potatoes, but are usually more elongate, and generally pale yellow with violet "eyes." When cooked they are rather sweet and palatable but "wet." The Peruvian

peasants freeze them after soaking them in water, then they are sun-dried or pressed and dried, for preservation for an indefinite period, in the same manner in which they treat potatoes. After this treatment they resemble "chuño" and like it emit an odor in cooking that is very disagreeable to one not accustomed to it, but after some experience, as in the case of the "chuño" or potato so preserved, they may be eaten with some relish, at least upon necessity. Herrera records the name "lingli" for the dried product; Pflanz, "tunta." Ruiz and Pavón found them a common food but eaten also as an aid in child-birth.

Ullucus tuberosus Lozano in Caldas, Semanario de Nueva Granada 185. 1809. *Basella tuberosa* HBK. Nov. Gen. & Sp. 2: 189. 1817. *Melloca peruviana* Moq. in DC. Prodr. 13, pt. 2: 225. 1849. *U. Kunthii* Moq. Bibl. Univ. Genève 11: 80. 1849.

Leaves long-petioled, cuneate to subcordate at the base, rounded or obtuse at the apex, often mucronulate, sometimes 20 cm. broad; racemes of greenish yellow flowers shorter than the leaves, bracteolate, the lower bractlets longer than the pedicels.—According to Ulbrich, the tubers of the wild form are the size of pigeon eggs, rose-violet in color, the plants developing little tubers in the leaf axils and attaining a length of 50 cm. The species is variable, and Herrera, Contr. Fl. Cuzco ed. 2. 70–72. 1921, has recorded the native names of cultivated and wild races as they occur in that department as follows:

Tubers white: Mestiza chchuccha, yurac-lisas, or yurac-ckolla, the last with tubers produced in abundance but very small.

Tubers yellow: Ckello-chuccha, ckello-lisas, or ckello-ckolla.

Tubers yellowish red: Bela-api-chchuccha.

Tubers rose-colored: Muru-chchuccha, muru-lisas, or muru-ckolla, the last large.

Tubers reddish: Puca-lisas.

Herrera notes further, without indication of color: Chucchan-lisas, long and of superior quality: Ckolla-lisas, considered inferior; Kitalisas (wild "papas lisas"), extremely bitter, not edible; and Atoc-lisas or kipa ullucu (kipa ul juku), (wild smooth potatoes), esteemed fresh. The former has been found in the provinces of Paucartambo, Urubamba, and Huaipo, the latter in Anta, Quispicanchi, and Urubamba. The species is said to ascend to over 3,800 meters in a wild state in Bolivia, and in Peru it is found in the central sierra

and interandean regions (Weberbauer), where especially frequent in cultivation. Illustrated, Pflanzenfam. ed. 1. 16c: 267.

Lima: Near Tambo de Viso, *Weberbauer 147;* 169. Rocky places above Chicla (*Ball*). Matucana, *Weberbauer 170.* Río Blanco, 4,500 meters, *3044.* Without locality (*MacLean*, type of *M. peruviana*). Colombia; Bolivia. "Papa lisa," "lisas," "ullucu," "ul juku."

3. BOUSSINGAULTIA HBK.

Tandonia Moq. in DC. Prodr. 13, pt. 2: 226. 1849.

Reference: Hauman, Anal. Mus. Nac. Buenos Aires 33: 347–359. 1923–1925.

Glabrous, more or less twining, rather sparsely leaved herbs, usually drying almost black, including the axillary racemes of small flowers. Sepals blunt, shell-shaped. Style 1, often basally 3-parted. Fruit included in the sometimes keeled sepals or bractlets.—United by Baillon, Hist. Pl. 9: 198. 1888, with *Anredera* Juss., with which it naturally belongs, but unfortunately, from a practical standpoint, the union now is inconvenient, since all the known species except one have been described under the later name of HBK.

Leaves definitely cordate; pedicels filiform.....*B. filiformis.*

Leaves little or not at all cordate; pedicels thickish, short.

Leaves not oblongish; racemes usually simple, the flowers often tinted.

Leaves broadly elliptic.....*B. diffusa.*

Leaves obovate-rhombic.....*B. minor.*

Leaves oblong-lanceolate; racemes often branched; flowers white. *B. Weberbaueri.*

Boussingaultia diffusa (R. & P.) Volkens, Pflanzenfam. 3, 1a: 128. 1893. *Basella diffusa* R. & P. in lit. in syn. *Tandonia diffusa* Moq. in DC. Prodr. 13, pt. 2: 226. 1849.

Leaves broadly elliptic, acuminate, about 3 cm. wide; racemes spike-like, several cm. to 10 cm. long; sepals narrowed to the base; bractlets longer than wide; flowers tiny, subsessile, whitish, yellowish, or purplish.—*B. Volkensii* Ulbrich in Engl. & Prantl, Nat. Pflanzenfam. ed. 2. 16c: 269. 1934 (*B. cordifolia* Volkens), *B. obovata* (HBK.) Haum. Anal. Mus. Nac. Buenos Aires 33: 352. 1925, and *B. marginata* (HBK.) Britton, all of Ecuador, may be expected; the first has sessile flowers and keeled sepals; the others broad-based sepals, *B. obovata* with obovate, obtuse leaves, *B. marginata* with

leaves oval and acute. **B. boliviensis** (Hauman) Macbr., comb. nov. (*B. ramosa* Hemsl. var. *boliviensis* Hauman, op. cit. 353), to be expected, has keeled sepals like *B. Volkensii* but pediceled flowers; it differs from *B. ramosa* of Mexico in having bractlets about twice as long as the pedicels, lighter-colored, larger leaves, etc. To *B. diffusa* apparently belongs all Peruvian material formerly referred to *B. baselloides* HBK., which has pedicellate flowers fully 2 mm. long with oblong sepals similar to the petals. Often cultivated, it may well occur, as also *B. cordifolia* Tenore (*B. gracilis* Miers, f. *pseudo-baselloides* Hauman, Anal. Mus. Nac. Buenos Aires 33: 356. 1925, probably the same according to Harms) confused with it in literature but readily distinct by its 3-parted style. The fleshy rhizomes are a common food (Ruiz & Pavón). The plant ranges from the coast to over 2,000 meters in the sierras.

Lima: Huara, Lima, and Pillao, *Ruiz & Pavón.* Chosica, *Weberbauer 5316* (det. Ulbrich). San Agustín, *Weberbauer 5229* (det. Ulbrich). Matucana, *Weberbauer 161.*—Amazonas: Between Chachapoyas and Moyobamba, *Raimondi.*—Ayacucho: Chaviña, *Weberbauer 5787.*—Ancash: Ocros, *Weberbauer 2730.*—Cuzco: *Raimondi.* Ollantaitambo, 2,800 meters, *Herrera 3410.*—Arequipa: Above Posco (*Günther & Buchtien 302;* det. Bruns as *B. baselloides*). Southern slopes of Chachani Mountain, 3,660 meters, *Hinkley 78.*—Huánuco: San Rafael, 2,550 meters, *3144.* Cabello, 2,400 meters, *1337.* "Lloto del cerro."

Boussingaultia filiformis (Moq.) Hauman, Anal. Mus. Nac. Buenos Aires 33: 352. 1925. *Tandonia filiformis* Moq. in DC. Prodr. 13, pt. 2: 227. 1849.

Well marked by its slender pedicels as long as the flowers, 1.5 mm. long, its triangular, obtuse sepals, and especially by its cordate leaves, acute at the apex.

Peru: Without locality, *Ruiz & Pavón.*

Boussingaultia minor Diels, Bot. Jahrb. 37: 400. 1905.

Slender, scarcely twining, with subsessile, oblong-ovate or rhombic-ovate leaves, long-cuneate at the base, 2–3 cm. long, 6–15 mm. wide; spikes shorter or little longer than the leaves; flowers sessile, the unequal, concave segments 2 mm. long, white within, reddish without; bracts lanceolate, acute; ovary nearly 4 mm. long, the single style about twice as long.

Junín: Tarma, 3,000 meters, *Weberbauer 2351.*

Boussingaultia Weberbaueri Ulbrich, Pflanzenfam. ed. 2. 16c: 270. 1934.

A twining half shrub; leaves lanceolate, acute; involucral leaves plane; flowers white, 2–2.5 mm. long, abundant in peduncled, often much branched racemes; style 1; stigmas 3, strongly papillose. Neg. 29513.

Cajamarca: Huambos, 2,700–3,000 meters, *Weberbauer 4185*, type.—Huánuco: San Rafael, 2,550 meters, *3143*.—Lima: San Buenaventura, 2,800 meters, open, rocky slopes, *Pennell 14508*.

4. ANREDERA Juss.

Similar to *Boussingaultia* HBK., but restricted to the one original species, characterized by densely flowered racemes about 8 mm. thick, the conspicuously pediceled flowers yellowish and somewhat translucent as are also the straw-colored, dorsally winged fruiting sepals. Unlike species of *Boussingaultia*, this plant dries light green.

Anredera scandens (L.) Moq. in DC. Prodr. 13, pt. 2: 230. 1849. *Polygonum scandens* L. Sp. Pl. 364. 1753.

Leaves narrowed at each end, acute; style completely 3-parted.—The tuberous roots are used for food. Cultivated, especially in Spain.

Peru: (Weberbauer, 307). North to Texas and the West Indies.

67. CARYOPHYLLACEAE. Pink Family

Reference: Pax & Hoffmann, Pflanzenfam. ed. 2. 16c: 275–364. 1934.

Herrera, in one of his several useful "Contributions to the Flora of the Department of Cuzco," has recorded *Dianthus Caryophyllus* L., the carnation or "clavel" as cultivated in abundance in gardens for its beauty and for making perfume, and far to the north in the Department of Ancash, near the coast, I saw it grown in rows many rods in extent for the same purposes. Most of the genera, as Pax and Hoffmann state for *Paronychia*, "bedarf dringend einer systematischen Bearbeitung," so that the following synopsis of the Peruvian genera is largely based on scattered references and on the partial revisions of Rohrbach and Williams. Mattfeld in 1922, Repert. Sp. Nov. 18: 171, announced a report on the Muschler species based on Weberbauer plants, but none has been forthcoming except for one genus (*Pycnophyllum*). Accordingly, except for a few of the Muschler species seen, they have not been included in the

keys or new combinations made, for his descriptions are unreliable and his names, as Mattfeld suggests, op. cit., may be considered nomina nuda. Nevertheless, since they often represent new species, it seems best to give the apparently salient characters from his descriptions, sometimes correct, in order to have a record of the collections to which they refer.

The genera of this family are for the most part intangible concepts, often not separable or tenable on the basis of logic—which is one reason why *Plettkea* Mattfeld is questionably a valid or expedient segregate—because the species themselves are plastic (see note under *Stellaria media*). All generic keys, therefore, as the following, are only suggestive, and one should be warned that there are exceptions in most characters for most genera. In addition to the genera listed here, *Corrigiola* L. may occur; it is rather similar to *Paronychia*, but the stipules are deciduous below or minute, and the styles 3 instead of 2. *Heliospermum* (*Heliosperma* Reichenb.), accredited to Peru by Weberbauer, 175, 354, must be a reference to some species of *Silene* sens. lat. (*Melandrium* or *Lychnis*). The hairy *Agrostemma Githago* L., of Europe, with linear calyx lobes that well exceed the rather showy petals, may be found adventive in cultivated fields, especially in stands of maize or other grain. A number of species, especially those proposed by Muschler, are listed alphabetically in the genera to which they belong without, however, making the transfer.

It is fitting to acknowledge here the kindness of Dr. Charles Baehni in making herbarium comparisons and careful dissections for me.

Sepals slightly if at all united.

Plants without stipules (cf. *Drymaria*).

Fruit capsular; plants scarcely if at all cushion-forming, sometimes densely matted.

Plants mostly low-matted, or with congested inflorescences; capsule teeth of the same number as the styles, or in *Arenaria* twice as many.

Petals entire or merely lobed.....5. *Arenaria.*

Petals, if present, minute.....1. *Sagina.*

Petals none.....2. *Colobanthus.*

Plants mostly open-growing and open-flowering; capsules with twice as many teeth as styles.

Petals 2-lobed; pods dehiscent by twice as many teeth as styles.....3. *Cerastium.*

Petals 2-parted or 2-lobed; pods splitting into as many valves as styles.....4. *Stellaria.*

Fruit not capsular; a cushion-like plant....6. *Pycnophyllum.*

Plants usually with stipules.

Fruit not capsular; dense herbs or half-shrubs with conspicuous, silvery or white stipules.

Sepals abruptly spinulose from a mostly cucullate tip. 7. *Paronychia.*

Sepals gradually spine-tipped.....8. *Cardionema.*

Fruit capsular; plants more or less openly branched, or simple herbs, the stipules relatively inconspicuous.

Styles more or less united; leaves often broader than linear.

Stipules minute, often caducous; inflorescence usually openly cymose, sometimes head-like....9. *Drymaria.*

Stipules rather obvious; flowers densely cymose.

Sepals keeled.....10. *Polycarpon.*

Sepals not keeled.....11. *Polycarpaea.*

Styles free; leaves linear.....12. *Spergularia.*

Sepals definitely united, forming a tube.....13. *Silene.*

1. SAGINA L.

Small or diminutive herbs bearing several long-stalked, whitish flowers. Stamens in one or two whorls. Petals sometimes obsolete.

Sagina apetala Ard. Animadv. Bot. 2: 22. *pl. 8.* 1763.

A tiny annual, rarely more than a few cm. tall, with filiform stems and long, capillary pedicels, these straight or slightly curved at maturity; leaves setaceous, 3–7 mm. long, sometimes puberulent or with a few cilia at the base; sepals 4 and 1.5 mm. long, all or some of them obtuse; petals evanescent, minute, sometimes apparently lacking; capsule 2 mm. long.—The following specimen was recorded by Weberbauer, 171, as *S. ciliata* Fries, of Europe, more properly var. *ciliata* (Fries) Mert. & Koch., with curved pedicels and appressed sepals. I did not find the specimen at Dahlem. The cosmopolitan *S. procumbens* L., with 4 or 5 obtuse sepals (sometimes with some flowers with 4, others with 5 on the same plant!), is distinguished otherwise by its creeping habit, the stems rooting and

tending to become perennial. *S. saginoides* (L.) Dalla Torre (*S. Linnaei* Presl), with curved pedicels and floral parts always in 5's, may occur; its sepals, according to Fernald, are typically 2–3 mm. long, its capsules 3.4 mm. long. *S. humifusa* (Camb.) Fenzl, of Brazil and perhaps eastern Peru, also pentamerous, has petals and calyx 2 mm. long.

Ayacucho: Pampalca, 3,200 meters, *Killip & Smith 23281.*—Cajamarca: Meadow moor, 3,500 meters, Ocros (Weberbauer, 171?; see note above). Ecuador; Canary Islands; Australia; South America (Pax & Hoffmann).

2. COLOBANTHUS Bartl.

Thick-rooted plants bearing a solitary flower, the short stem or peduncle thickened above; stamens 4–5, alternate with the same number of sepals.—Illustrated, Presl, Rel. Haenk. 2: *pl. 49.*

Colobanthus crassifolius (D'Urv.) Hook. f. Fl. Ant. 248. 1844–47. *Sagina crassifolia* D'Urv. Mém. Soc. Linn. Par. 4: 617. 1826. *C. quitensis* Bartl. in Presl, Rel. Haenk. 2: 13. 1831. *S. quitensis* HBK. Nov. Gen. & Sp. 6: 19. 1823.

A little, tufted plant with grass-like, linear, rigid or soft leaves 1–1.5 cm. long or sometimes longer, and slender scapes as long or a little longer, bearing the single flower; sepals acutish, ovate-oblong; capsule exserted.—The following collection, determined by Gray as *C. crassifolius* Hook. f., apparently lacked the bracts sometimes borne on the scape or peduncle; the plant is variable in size.

Junín: Casa Cancha (*Wilkes Exped.*). East of Canta, open slope, *Pennell 14671.* Colombia to Patagonia.

3. CERASTIUM L.

Reference; Rohrbach, Linnaea 37: 283–308. 1872.

Plants usually pubescent, often densely so, the Peruvian forms frequently perennial. Flower parts regularly 5 or infrequently reduced to 3 or 4, or the stamens from 10 to 5 or 4. Capsule most often curved, especially when exserted.—Descriptions of the older forms are mostly taken directly from Rohrbach. F. N. Williams published a partial list with notes in Journ. Bot. in 1898, 1899, 1921, 1922 (not only in the first three years as cited in Pflanzenfamilien), which has been referred to, as likewise a partial key in Bull. Herb. Boiss. I. 6: 893. 1898. I am indebted also to Fernald & Wiegand, Rhodora 22: 171, 177, 178. 1920, for the key characters

and descriptions of *C. arvense* and *C. vulgatum*. The key otherwise is based in large part on descriptions. The types of Muschler species, not seen by me, are especially dubious. Herrera has listed for Cuzco (*Herrera 2114*, Valle de Santa Ana) a "*C. biflorum* Poepp.," a name I have not found.

A. Perennials.

Bracts broadly scarious-margined.

Basal branches herbaceous, with few axillary tufts; petals and sepals subequal.....*C. vulgatum.*

Basal branches finally marcescent, the axillary tufts conspicuous; petals 2–3 times as long as the sepals.....*C. arvense.*

Bracts herbaceous, or the uppermost very narrowly scarious-margined.

Plants low or diminutive, pulvinate or densely tufted, the parts above ground only 1–4 cm. high, or the stems, if longer, creeping-assurgent, densely clothed with dead leaves; leaves soft, thin (cf. *C. vulgatum* var. *andinum* Gray).

Leaves more or less pubescent or glabrous, never white-tomentose.

Capsule well exserted; pedicels enlarged toward the base. *C. crassipes.*

Capsule often scarcely if at all exserted; pedicels slender.

Plants densely pulvinate.

Plants more or less pubescent, often robust.

Calyx 2–4 mm. long.....*C. Behmianum.*

Calyx 5–8 mm. long.....*C. soratense.*

Plants essentially glabrous, diminutive....*C. nanum.*

Plants rather loosely tufted, the stems often assurgent.

Sepals narrowly oblong.....*C. imbricatum.*

Sepals elliptic or elliptic-oblong.....*C. peruvianum.*

Leaves closely white-tomentose, glabrate only in age. *C. candicans.*

Plants often cespitose but open in habit, the principal, erect or suberect stems to about 10 cm. high or higher; leaves rather firm or somewhat rigid (see also *C. trichocalyx*, not included in the key).

Plants densely white-lanate or floccose-pubescent throughout.

Inflorescence soon open; stem leaves scarcely imbricate. *C. mollissimum.*

Inflorescence crowded; stem leaves well imbricate.
C. floccosum.

Plants green but often more or less villous.

Flowers crowded, pseudo-umbellate, terminal.

Sepals and often the leaves glandular-pilose.

Capsule well exserted; pedicels more or less nodding or refracted.

Leaves densely short-pubescent, more or less revolute.
C. Danguyi.

Leaves sparsely and loosely pilose, plane.
C. Trianae.

Capsule included or slightly exserted; pedicels erect.
C. mucronatum.

Sepals eglandular, the leaves glabrous above.
C. tucumanense.

Flowers axillary, solitary, few.....*C. subspicatum.*

A. Annuals (*C. subspicatum* as a biennial might be sought here).

Petals ciliate below.....*C. viscosum.*

Petals glabrous.

Capsule teeth erect; plants more or less viscid-pubescent.
C. nutans.

Capsule teeth recurved-revolute; plants glabrate.
C. humifusum.

Cerastium arvense L. Sp. Pl. 1: 438. 1753.

A matted or tufted perennial, with depressed or trailing, tough basal branches bearing marcescent leaves and abundant axillary fascicles or leafy tufts; flowering branches ascending, simple to freely branched, 2–60 cm. high, glabrous to densely villous, glandless to densely glandular; leaves linear-subulate to narrowly ovate, flaccid to rigid, acute to obtuse, glabrous to velutinous, glandless or glandular, 1–6 cm. long, 0.5–13 mm. broad, mostly confined to the lower two-thirds of the branch; inflorescence few- to many-flowered, its bracts scarious-margined; sepals 4.5–8.5 mm. long, glabrous, pilose, or glandular; petals 2–3 times as long as the sepals, the broad lobes spreading in anthesis, the claw glabrous; capsule cylindric, equaling to much exceeding the calyx; seeds reddish, 0.3–0.7 mm. in diameter, the testa close and tuberculate.—Description by Fernald & Wiegand, Rhodora 22: 178. 1920. Forma *oblongifolium* (Torr.) Pennell, with elongate capsule, near Lima according to Weberbauer, 169, is scarcely

distinct, as also *C. arvense* var. *arvensiforme* (Wedd.) Rohrb. (*C. arvensiforme* Wedd. Ann. Sci. Nat. V. 1: 296. 1864), accepted by F. N. Williams, which is, apparently, a large-leaved, large-flowered form, the sepals 6–8 mm. long; var. *nervosum* (Naud.) Reiche, Fl. Chile 1: 184. 1896, glandular with elliptic-oblong leaves 4–8 mm. long, seems better marked. Neg. 27711 (var. *nervosum*).

Puno: Titicaca highlands (Weberbauer, 219 as *C. nervosum*).—Lima: At about 3,000 meters (Weberbauer, 169, as *C. oblongifolium*). North and South America; Eurasia.

Cerastium Behmianum Muschl. Bot. Jahrb. 45: 446. 1911. *C. imbricatum* HBK. var. *Mandonianum* Rohrb. Linnaea 37: 293. 1872.

Stems ascending, 3–5 cm. long, sparsely if at all branched, becoming glabrous; leaves at first rather pubescent, somewhat ciliate, finally glabrate, oblong or ovate-oblong, acutish or rarely obtusish, 0.5–2 cm. long, 1–3 mm. wide; flowers few, solitary, on pubescent pedicels, in fruit semi-erect and somewhat longer than the calyx; sepals oblong, obtuse or acutish, scarious-margined, apically glabrous, equaled by the petals; capsule scarcely exserted, the teeth revolute; seeds tuberculate, with inflated epidermis.—Description drawn in part from an apparent cotype in Herb. Delessert. Negs. 29833, 29834.

Junín: Yauli, 4,400 meters, *Weberbauer 558*. Bolivia.

Cerastium candicans Wedd. Ann. Sci. Nat. V. 1: 295. 1864; 302.

Stems ascending or suberect, many, some of them sterile, crisply short-pubescent, 3–10 cm. high; leaves narrowly lanceolate, acute, white-tomentose but becoming smooth above, 1.5–2 cm. long, 3 mm. wide; flowers few, loosely umbellate, the tomentose fruiting pedicels longer than the lanceolate, acute sepals, these only 5 mm. long, dorsally tomentose, apically glabrous, scarious-margined; petals as long as the sepals, emarginate; stamens 10; capsule cylindric, to nearly twice as long as the calyx; seeds obtusely granulate. Neg. 27707.

Puno: Titicaca highlands, 4,400 meters (Weberbauer, 219). Ecuador.

Cerastium crassipes Bartl. in Presl, Rel. Haenk. 2: 18. 1831; 296. *C. orophilum* Wedd. Ann. Sci. Nat. V. 1: 295. 1864 (fide Rohrbach).

Stems crowded, cespitose, diffuse, crisply white-strigose or pilose, as also the leaves, peduncles, and sepals; lower rosulate leaves linear-oblanceolate, 15–25 mm. long, 2–4 mm. wide, the upper shorter and broader, acuminate; inflorescence glomerulate and finally umbellate; pedicels 2–3 times longer than the calyx, strongly enlarged below the middle, incurved and glabrescent in fruit; sepals oblong, obtuse, scarious-margined, 4–5 mm. long; stamens 5 or 10; petals slightly longer, bifid one-third their length, scarcely clawed; capsule half again as long as the calyx; seeds large, densely and coarsely tuberculate.—Sometimes a tiny plant, as the Weddell specimen, again robust with fistulose stems 15 cm. long and leaves 3 cm. long (a Chilean form). The Weddell species is maintained by Pax and Hoffmann in *Pflanzenfamilien*. Neg. 27709.

Huánuco: Montaña (*Haenke*, type).—Puno (?): Macusani (*Lechler*).—Junín: Casapalca, 5,000 meters, *840*. Bolivia.

Cerastium Danguyi Macbr., nom. nov. *C. Trianae* Danguy & Cherm. Bull. Mus. Hist. Nat. Paris 28: 432. 1922, not Briq., 1911.

Stems ascending, 25–40 cm. high, with the leaves shortly but densely pubescent, more or less glandular toward the tip; leaves numerous, the lower somewhat crowded, the upper about equaling the internodes, linear-lanceolate, 1.5–2 cm. long, 3–4 mm. broad at the base, acute, the margin manifestly revolute; inflorescences rather contracted, few-flowered; pedicels at first nodding, 0.5–1 cm. long, glandular-pilose like the lanceolate, obtusish sepals, these 5–6 mm. long; petals 7–8 mm. long; capsule 10–12 mm. long; seeds tuberculate.—Apparently, with *C. Trianae* Briq., well distinct from *C. Kunthii* Briq. (*C. glutinosum* HBK. Nov. Gen. & Sp. 6: 29. 1823) of Colombia, which is very glutinous, with erect pedicels 15–25 mm. long and flat leaves (fide Danguy). Neg. 29835.

Huánuco: Tambo de Vaca, 4,000 meters, wet, mossy uplands, *4360*. Ecuador; Colombia. "Puscala."

Cerastium floccosum Benth. Pl. Hartw. 162. 1839; 300.

In general similar to *C. mollissimum*, but the pubescence tomentose-floccose, composed of branched and simple hairs; calyx early campanulate, 10–12 mm. long, the petals and capsule about as long.—*C. candicans* Wedd. has smaller leaves becoming glabrous above, the calyx lobes only 5 mm. long. Neg. 27710.

Peru: Without locality, *Ruiz & Pavón* (det. Mattfeld).—Junín: Mount Juntai, 4,700 meters, *Killip & Smith* 22059. Hacienda Runatullu, 4,400 meters, *Weberbauer 6625*. Ecuador; Colombia.

Cerastium humifusum Camb. in St. Hil. Fl. Bras. 2: 120. 1829.

A nearly glabrous annual with spreading, creeping stems, branching, to 20 cm. long or longer; leaves oblong, narrowed to the base, obtusish, 1–3 cm. long, exceeded by the filiform, glandular-puberulent pedicels; sepals ovate-oblong, obtusish, 4 mm. long, very sparsely if at all pubescent, twice exceeded by the oblong, bifid petals and the ovate capsule, the teeth of the latter recurved-revolute; seeds obtusely and coarsely granulate.—Widely distributed in South America, according to Pax and Hoffmann, so probably frequent in Peru. Illustrated, Mart. Fl. Bras. 14, pt. 2: *pl. 64.*

Lima: At 3,000 meters, above Lima (Weberbauer, 169). South America.

Cerastium imbricatum HBK. Nov. Gen. & Sp. 6: 28. 1823.

Much branched, the creeping stems covered below with the bases of dead leaves; leaves sessile, more or less densely imbricate, spatulate-oblong, soft-villous, 8–15 mm. long, 2–5 mm. broad; flowers terminal, the puberulent pedicels 2 mm. long, or longer in fruit; calyx short-pilose, campanulate, the sepals oblong, obtusish, the interior scarious-margined, 2–4 mm. long, twice exceeded by the oblong, cuneate-based petals; capsule curved, equaling or slightly longer than the calyx; seeds brown, puncticulate-tuberculate.

Cajamarca: Puccha Valley, 4,400 meters (Weberbauer, 224).—Ancash: Huaraz (Weberbauer, 225). Bolivia; Ecuador; Colombia.

Cerastium mollissimum Poir. Dict. Suppl. 2: 164. 1811; 298. *C. Willdenowii* HBK. Nov. Gen. & Sp. 6: 29. 1823.

Perennial, the usually suberect branches to 50 cm. tall, these with the leaves and, to greater or less extent, the calyx densely white-lanate with stellately branched trichomes; leaves lanceolate, long-acuminate, 3–5 cm. long, 5–10 mm. broad; flowers few to many, often laxly umbellate, the filiform pedicels 3 cm. long or longer; sepals lanceolate, acute, green, narrowly margined, 7–10 mm. long; petals to even twice as long, shallowly bilobate, obovate-cuneate; capsule teeth straight, the capsule long-exserted or in var. *diffusum* Fenzl less so; seeds brown, acutely tuberculate.—*C. andinum* Benth. Pl. Hartw. 162. 1839, is a "lusus," fide Rohrbach, with calyx lobes white-lanate; *C. Willdenowii* is the less pubescent, typical form; both are maintained by Pax and Hoffmann as species in *Pflanzenfamilien.*

Peru: (*Jussieu*, type). Without locality, *Ruiz & Pavón* (det. Mattfeld).—Huánuco: Huallaga, 3,800 meters, *Weberbauer 6726.*

Tambo de Vaca, 4,500 meters, *4426*. Southern South America and in the Andes north to Colombia.

Cerastium mucronatum Wedd. Ann. Sci. Nat. V. 1: 294. 1864; 301.

A softly pubescent and more or less glutinous perennial, 5–15 cm. tall, with a number of densely leafy, fascicled and creeping sterile stems; leaves linear or spatulate-lanceolate, narrowed at the base, mucronulate, densely hirsute-scabrous, 3–5 cm. long, 3–8 mm. wide; flowers few, subtended by leafy, acuminate, mucronate bracts; pedicels and truncate-campanulate calyx subequal; sepals densely glandular, 7–8 mm. long, shorter than the ovate-oblong, emarginate petals; capsule probably little exserted.—Allied by Rohrbach to *C. floccosum* Benth., but certainly very different in pubescence. Neg. 27712.

Puno(?): (*Weddell*).—Lima: Viso, wet, rocky crevices, *617*.—Cuzco(?): Marcapata, 3,300 meters, in shrubwood, *Weberbauer 7794*. Bolivia.

Cerastium nanum Muschl. Bot. Jahrb. 45: 447. 1911.

Stems crowded, simple, 1–2 cm. long, glabrate; leaves at first minutely or obscurely ciliate, narrowly ovate-oblong, acutish, scarcely 1 mm. long, to 0.5 mm. broad; flowers apparently solitary; pedicels concealed by the leaves; calyx lobes oblong-acutish, green, subscarious-margined, glabrous, 1.5–2 mm. long; petals slightly longer; capsule twice as long, nearly straight(?); seeds small, obtusely granulate (according to Muschler). Neg. 29721.

Cajamarca: Ocros, 4,400 meters, *Weberbauer 2781* (type).—Moquehua: Carumas, 4,400 meters, *Weberbauer 7323*.

Cerastium nutans Raf. Préc. Decouv. 36. 1814; 288. *C. longipedunculatum* Muhl., a nomen nudum (fide Gray, Man.) but in general use.

Stems ascending, erect, more or less branching, to 40 cm. high, viscid-pubescent; leaves lanceolate, acutish, 2–4 cm. long, 3–6 mm. broad; flowers many, often subumbellate; pedicels somewhat glandular-puberulent, straight except at the tip, or deflexed in fruit, usually 3–5 times longer than the calyx; bracts herbaceous; sepals lanceolate, obtusish, scarious-margined, puberulent, 4–5 mm. long, the petals usually half again as long; capsule curved, to 3 times longer than the calyx; seeds lightly and obtusely granulate.—See also *C. subspicatum* Wedd.

Peru (?). Widely distributed in North and South America (Pax & Hoffmann).

Cerastium peruvianum Muschl. Bot. Jahrb. 45: 445. 1911.

Caespitosum depressum ramosissimum repens undique molliter villosum; ramis brevibus confertis densissime foliosis basibus foliis marcidis obtectis ad 3–4 cm. longis, caulibus floriferis 3–4 cm. altis plerumque 3-floris; foliis dense imbricatis oblongo-ellipticis obtusis circa 7 mm. longis 4 mm. latis superioribus paullo reductis subovatis subacutis; pedicellis 3–5 mm. longis plerumque suberectis; sepalis extus villoso-glandulosis et nigro-punctatis et lineatis intus glabris fere oblongis obtusis 6 mm. longis quam petala emarginata paullo brevioribus; capsulis cylindrico-oblongis 8 mm. longis leviter curvatis dentibus erectis margine vix vel haud revolutis; seminibus brunneis acute denseque tuberculatis.—A description is offered for the Cuzco plant, the type of Muschler not having been seen and anyway probably poorly described.

Cuzco: Stony places west of Marcapata, 4,600 meters, *Weberbauer 7775*. Without locality, *Weberbauer 7078*.—Junín: La Oroya to Tarma, 4,300 meters (*Weberbauer 2598*, part of type).—Ancash: Ocros, 4,400 meters (*Weberbauer 2798*, part of type). Ecuador.

Cerastium soratense Rohrb. Linnaea 37: 291. 1872.

Stems ligneous below, ascending-prostrate, cespitose, little branching, like the pedicels and calyx puberulent, 5–8 cm. long; leaves linear or spatulate-lanceolate, obtusish, both sides and margins hirsutulous, 15–20 mm. long, 2–4 mm. wide; inflorescence terminal, few-flowered, the subrecurving pedicels and calyx subequal; sepals oblong-lanceolate, acuminate or obtusish, green, scarcely scarious-margined, 5–8 mm. long; petals white, a third longer than the calyx, ovate-oblong, lobed one-third their length, with 2 ovate, obtuse lobes, barely clawed; capsule slightly curved, not at all or barely exserted; seeds brown, minutely and acutely tuberculate.—*C. imbricatum* HBK. has softer, longer pubescence and subequal sepals and petals. Neg. 27713.

Puno: Lake Titicaca (*Meyen*). Bolivia.

Cerastium subspicatum Wedd. Ann. Sci. Nat. V. 1: 295. 1864; 287.

Biennial or scarcely more enduring, soft-hirsutulous and more or less glandular or viscid throughout; leaves linear-oblong or lanceolate; inflorescences soon loose and elongate; bracts herbaceous;

fruiting pedicels equaling or longer than the calyx and more or less divaricate or refracted; sepals acute, hirsutulous, exceeded by the curved capsule and by the petals, or these lacking, then the stamens mostly only 5 (var. *apetalum* Wedd.).—Plants with the habit of *C. vulgatum*, to which Rohrbach reduced it, but the bracts not at all scarious-margined. Except that it is more enduring and more cespitose or tufted at the base, it seems scarcely distinguishable from *C. nutans*. *C. obscurum* Triana & Planch. belongs here. Neg. 29836.

Junín: Morococha, *Isern 2247*. Huarón, bunchgrass slopes, 4,000 meters, *1134*. Cerro de Pasco, grassy slopes, 4,000 meters, *3080*. Mount La Juntai, *Killip & Smith 22088*.—Without locality: (*Weddell*, type).—Huánuco: Near Mito, bunchgrass slope, *1885*.—Puno: Araranca, rocky knoll, 4,100 meters, *Pennell 13461*.—Lima: Rocky canyon wall east of Canta, *Pennell 14644*. Bolivia; Colombia.

Cerastium Trianae Briq. Ann. Cons. Jard. Genève 13–14: 282. 1911. *C. caespitosum* Triana & Planch. Ann. Sci. Nat. V. 17: 152. 1862, non Gilib., 1781.

Stems many, decumbent-ascending, densely leafy, 10–15 cm. long; leaves lance-linear, gradually narrowed to the acute or obtusish apex, plane, 2.5 cm. long, 4–6 mm. wide, loosely and sparsely glandular-pilose; flowers few; pedicels thick, densely pubescent, after anthesis elongating and refracted; sepals ovate-lanceolate, obtuse, densely glandular-pilose, 6 mm. long; petals half again as long as the sepals, as also the capsule; seeds minutely punctulate.

Huánuco: Chasqui, wet, grassy slope, *3291;* like the type except that the capsule is more curved. Ecuador; Colombia.

Cerastium trichocalyx Muschl. Bot. Jahrb. 45: 445. 1911.

Apparently very similar, if not referable, to *C. soratense* or *C. imbricatum*; stems to about 20 cm. long; leaves finally subglabrous, 1–3 cm. long, 5–10 mm. broad; bracts herbaceous; sepals oblong, acutish, scarious-margined, 7 mm. long; petals slightly longer than the calyx, obcordate, bifid, clawed; capsule shorter than the calyx.

Ancash: Near Huaraz, 4,400–4,600 meters (*Weberbauer 2983*, type).—Lima: Viso, 3,000 meters, rock crevices and shallow soil, *605;* perhaps new, the leaves linear-oblong, glabrate.

Cerastium tucumanense Pax, Bot. Jahrb. 18: 25. 1893.

Perennial, with many erect or ascending, nearly simple, more or less densely villous, eglandular stems, to 25 cm. high, with elongate internodes; leaves lanceolate or linear-lanceolate, acute or the apex

obtusish, glabrous except for the densely ciliate margin, 3–4 cm. long, 4 mm. broad; flowers many, pseudo-umbellate; pedicels shorter than the sepals or sometimes as long, recurved; bracts herbaceous; calyx campanulate, the sepals oblong-lanceolate, acute, apically scarious or the inner scarious-margined, all villous, 7–8 mm. long; petals 1 cm. long, 4 mm. wide; calyx bilobate, obovate-spatulate; stamens 5; capsule cylindric, 1 cm. long; seeds brown, acutely tuberculate.—Differs from *C. mucronatum* and *C. soratense* in the merely ciliate leaves, scarious sepals, 5 stamens, and cylindric capsule (Pax).

Puno: Titicaca region, 4,000 meters (Weberbauer, 186).—Tacna: Candarave, 4,000 meters, tola heath, *Weberbauer 7374;* perhaps new, the flowers smaller and the seeds bluntly tuberculate. Argentina.

Cerastium viscosum L. Sp. Pl. 437. 1753; 283. *C. glomeratum* Thuill. Fl. Paris 225. 1799.

Pubescent and viscid-hairy like *C. vulgatum,* but annual and lacking the sterile leafy shoots, nearly erect, often more than 10 cm. tall; leaves ovate or more elongate and more or less obovate; bracts herbaceous; flowers in close clusters, the pedicels, even in fruit, shorter than the sharply pointed sepals, these exceeding the petals.—Var. *consanguineum* (Wedd.) Rohrb. (*C. consanguineum* Wedd. Ann. Sci. Nat. V. 1: 296. 1864) is a short-pubescent form with narrowly linear-lanceolate leaves; calyx lobes apically glabrous; petals wanting. It is retained as a species by Pax and Hoffmann in *Pflanzenfamilien.* Neg. 27708.

Junín: La Quinua, *2031.* Morococha, *891.* Tarma, bunchgrass slopes, *1056*(?).—Huánuco: Mito, *1738.*—Lima: San Lorenzo Island, 500 meters, *Weberbauer 5925.* Chancai, *Ruiz & Pavón* (det. Mattfeld). Río Blanco, *692.*—Lurín, *5948.*—Without locality: (*Dombey*). Río Moho, central Peru (*Weddell,* type of the var.).—Puno: Chuquibambilla, 3,900 meters, rocky puna slope, *Pennell 13415.*—Cuzco: Huancaro, *Vargas 3166.* Nearly cosmopolitan.

Cerastium vulgatum L. Fl. Suec. ed. 2. 158. 1755; 286. *C. caespitosum* Gilib. Fl. Lith. 159. 1781. *C. triviale* Link, Enum. Hort. Berol. 1: 433. 1821.

Flowering stems rather slender, 10–65 cm. high, simple or slightly branching, hirsute or rarely glandular; internodes elongate, the median becoming 2–12 cm. long; leaves of the season 3–7 pairs, oblong to narrowly oval, hirsute on both surfaces, the median 0.5–4 cm. long, 1.5–15 mm. broad; bracts similar but smaller, broadly

scarious at the margin and apex; inflorescence 3–60-flowered, forming a terminal, finally very dichotomous cyme, at first rather congested, in fruit with the lower pedicels divergent or reflexed and 2–4 times as long as the calyx; sepals 4–7 mm. long, ovate-lanceolate, acute, hirsute, the margins scarious; petals 4–8 mm. long, equaling or very slightly exceeding the sepals, cleft to the middle, with a ciliate claw; capsule 7–11 mm. long; seeds 0.5–0.7 mm. in diameter, reddish, tuberculate.—Description by Fernald & Wiegand, Rhodora 22: 177. 1920. See Briq. Prodr. Fl. Corse 1: 505–506. 1910, also Hauman & Irigoyen, Anal. Mus. Hist. Nac. Buenos Aires 32: 172. 1923–25, for arguments for the elimination of this name and also that of *C. viscosum* L., which does not seem to be justified, the elimination itself being bound to result in confusion; cf. Fernald & Wiegand, op. cit. Var. *hirsutum* Fries is glandless; var. *hirsutum* f. *glandulosum* (Boenn.) Druce is glandular.

Ancash: Samanco, 3,000–3,500 meters (Weberbauer, 170). Hualgayoc, 4,000 meters (Weberbauer, 271).—Junín: Yauli, 4,400 meters, between *Calamagrostis* tufts (Weberbauer, 222). Almost cosmopolitan.

Cerastium vulgatum L. var. **peruvianum** Gray, Bot. U. S. Expl. Exped. 120. 1854.

Later flowers apetalous; stems above and pedicels glandular-pubescent; leaves sessile, linear, 12–20 mm. long, 2 mm. wide; petals, if present, longer than the glandular calyx.—Another form is var. *andinum* Gray, loc. cit., scarcely glandular, condensed, the leaves oblong-linear, the petals a little shorter than the calyx. With the above broad interpretation of *C. vulgatum*, these varieties appear to have no significance. See also *C. subspicatum*.

Lima: Baños (*Wilkes Exped.*, type); also Obrajillo, Alpamarca (var. *andinum*).—Cuzco: Paucartambo, 3,400 meters (*Herrera 2318*). Ollantaitambo, 2,800 meters, *Herrera 3401*.—Puno: Chuquibambilla, rocky, limestone knoll, 3,900 meters, *Pennell 13385*. Near Puno, 4,000 meters, *Soukup 71*. Ecuador.

4. STELLARIA L.

Generally lax perennials with narrow, often green leaves and 2-parted or 2-lobed petals, or these rarely reduced or lacking.

Leaves broader than linear.

Petals shorter than the calyx or none; pubescence restricted to a line on stems and petioles.....*S. media*.

Petals longer than the calyx or lacking; pubescence not characteristically in lines.

Leaves all shorter than 1 cm.....*S. serpyllifolia.*

Leaves all or nearly all distinctly longer.

Sepals acute; petioles all short.....*S. ovata.*

Sepals obtuse; lower petioles as long as or longer than the leaves.....*S. cuspidata.*

Leaves linear or awl-shaped.

Leaves linear-oblong, narrowed at each end.....*S. xanthospora.*

Leaves narrowly ovate at the base, awl-shaped.*S. aphananthoidea.*

Stellaria aphananthoidea Muschl. Bot. Jahrb. 45: 444. 1911.

Branches crowded, cespitose, to 30 cm. long, sometimes slightly branched, at first minutely puberulent, as also the leaves, these linear, more or less spreading, 1–3 cm. long, 1–2 mm. broad, acute; flowers solitary, the mostly erect pedicels 2–3 cm. long, sometimes glandular-puberulent; sepals densely glandular-pubescent, ovate-lanceolate, 1 cm. long, obtusish, 3-nerved, green; petals scarcely as long, ovate. Neg. 29837.

Lima: Matucana, 2,500 meters, *Weberbauer 133* (type).

Stellaria cuspidata Willd. ex Schlecht. Ges. Naturf. Berl. Mag. 7: 196. 1816; HBK. Nov. Gen. & Sp. 6: 27. 1823. *S. ciliata* Vahl ex Pers. Syn. 1: 503. 1805, not Gilib., 1781. *S. prostrata* Baldwin, as to Weberbauer, 170 (probably). *S. leptopetala* Benth. Pl. Hartw. 163. 1839 (*S. leptosepala*, Weberbauer, 183).

Prostrate-ascending, sometimes rooting at the nodes, the weak branches usually more or less pubescent or puberulent; lower petioles often 10–15 mm. long, the upper becoming obsolete; leaf blades ovate-oblong, somewhat acuminate, more or less cordate at the base, typically glabrous, thin and to 4 cm. long or sometimes more or less coriaceous and as short as 1 cm.; peduncles elongate; sepals oblong-lanceolate, obtuse, ciliate toward the base, villous or less frequently glabrous, about 4 mm. long, the petals slightly longer to twice as long.—Apparently very variable and scarcely, as remarked by Gray, distinct from *S. nemorum* L. of Europe, with longer-petioled leaves, to which the following Weberbauer specimens with viscid pedicels and calyces have been referred in herb. Berlin. *S. micrantha* Spruce ex Rohrb. op. cit. 280 has broadly ovate, cordate-based leaves to 4 cm. long and half as broad, and acuminate sepals to 3 mm. long, half as long as the nearly 2-parted petals.

Lima: Matucana, *110.* Obrajillo (*Wilkes Exped.*, det. Gray). Montaña (*Jussieu*, type of *S. ciliata* Vahl, a small, glabrous var.). Mountains of Mongomarca, 300–400 meters, *Weberbauer 5686.* Río Blanco, 3,000–3,500 meters, open hillside, *Killip & Smith 21571.* Canta, 3,100 meters, moist bank, *Pennell 14606.* Atocongo, 250–500 meters, open, calcareous hills, *Pennell 14775.*—Cuzco: Paso de Tres Cruces, 3,800 meters, rocky banks and knolls on paramo, *Pennell 13830.*—San Martín: Zepelacio, 1,200–1,600 meters, in forest, *Klug 3530.*—Puno: Cuyocuyo, Sandía, 3,800 meters, *Weberbauer 925* (det. Muschler).—Loreto(?): San Antonio, Río Cumbaso, *Ule 6700* (det. Muschler).—Ancash: Lomas, 300 meters, *Weberbauer 5686.*—Cajamarca: Ocros, *Weberbauer 2677.*—Ayacucho: Osno, 3,300 meters, *Weberbauer 5569.*—Huánuco: Cani, *3393.* Chile to Mexico.

Stellaria media (L.) Vill. Hist. Pl. Dauph. 3: 615. 1789. *Alsine media* L. Sp. Pl. 272. 1753.

A bright green, small annual, the weak, diffuse or suberect stems pubescent in a line, as the petioles; leaves ovate, the upper sessile; petals shorter than the calyx and bifid, or none; stamens 2–10; styles 3–4; capsule narrowly ovoid, subcylindric; seeds more or less tuberculate.—Variable, especially in floral parts. For an interesting account of variation as illustrated in this plant see Matzke, Amer. Journ. Bot. 19: 477. 1932. Although Burnat as early as 1892 pointed out in Fl. Alp. Mar. 1: 257, that Cirillo, Essent. Pl. Char. Comm. 36. 1784, merely remarked that *Alsine media* L. is a species of *Stellaria* and failed to make the transfer, many authors have continued to attribute the combinations to him. Briquet, Fl. Cors. 1: 498. 1910, again called attention to the common error and, with his usual precision, corrected Burnat's spelling of the name of the Naples professor of botany from "Cyrillo," an error common also in America. Ball, Proc. Journ. Linn. Soc. 22: 31, records it as frequent about Chicla and thinks it is probably native.

Lima: Matucana, 2,370 meters (*Weberbauer 146*). Chicla (*Ball*). Lurín, rock slide, *5961.*—Huánuco: Mito, in clearing, *1713;* sunny stream flat, *1909.* Cosmopolitan in cool regions.

Stellaria ovata Willd. ex Schlecht. Ges. Naturf. Berl. Mag. 7: 196. 1816; HBK. Nov. Gen. & Sp. 6: 26. 1823.

Similar to *S. cuspidata;* leaves roundish or subrhombic-ovate, minutely apiculate, scarcely acute, about 1.5 cm. long and 1 cm. wide, glabrous but ciliate, like the (3 mm. long) petioles; pedicels

2.5 cm. long, divergent or reflexed in fruit; sepals elliptic-oblong, acute, pilose at the base, the petals nearly twice as long; seeds lenticular, laterally rugulose, tuberculate, brown.

Lima: Río Blanco, *694*. Matucana, *477*. Obrajillo (*Wilkes Exped.*, det. Gray).—San Martín: Tarapoto, *Spruce 4454*. San Roque, *Williams 7274, 7380*. Near Moyobamba, *Klug 3530* (det. as *S. nemorum;* see remark under *S. cuspidata*). To Mexico and Venezuela.

Stellaria serpyllifolia Willd. ex Schlecht. Ges. Naturf. Berl. Mag. 7: 196. 1816; HBK. Nov. Gen. & Sp. 6: 26. 1823.

Much branched, procumbent; leaves all short-petioled, ovate, acute, submucronate, rotund at the base, densely ciliate on the margins and midnerve beneath, the largest cauline leaves 8 mm. long and 6 mm. wide; sepals pubescent, oblong, obtuse; stamens 10.

Peru: (Probably). Ecuador.

Stellaria xanthospora Chod. & Wilcz. Bull. Herb. Boiss. II. 2: 293. 1902.

Stems weak, to 15 cm. long; leaves linear-oblong, acute at each end, glabrous, to 15 mm. long, 2.5 mm. wide; flowers axillary, on pedicels longer than the leaves, recurving below the tip; capsule slightly more than half as long as the calyx; seeds brown, inflated, lenticular.—"Affinis *S. lanuginosae* Rohrb. Monogr. in Linnaea 38: 260," according to Chodat and Wilczek. That plant, however, is *Arenaria lanuginosa* (Michx.) Rohrb. Linnaea 37: 259 (not "38: 260"), or *S. lanuginosa* (Michx.) Torr. & Gray, if preferred. According to Pax and Hoffmann, *Pflanzenfamilien*, the species of Chodat and Wilczek is a valid *Stellaria*, known from Chile and Colombia; the type locality, however, is Argentina! The species has not been seen by me.

Peru: (Probably, according to the range given by Pax and Hoffmann). Argentina; Chile; Colombia.

5. ARENARIA L.

Minuartia L. Sp. Pl. 89: 1753; *Alsine* Gaertn. Fruct. 2: 223. 1791.

Reference: F. N. Williams, Journ. Linn. Soc. 33: 326–437. 1898.

Plants often cespitose, usually perennial, with most often subulate, rigid leaves. Petals typically entire, sometimes wanting. Stamens 10, rarely 5. Disk more or less developed, often prominent. Styles normally 2 or 3.—Following Fernald, *Minuartia* is here included.

Sepals more or less inflexed and connivent; styles usually 2; cushion plants suggesting *Pycnophyllum*.

Petals longer than the calyx, or at least about as long.

Petals spatulate; plants densely matted.....*A. dicranoides*.

Petals oblong; plants open, the stems rooting at the nodes. *A. aphanantha*.

Petals distinctly shorter than the calyx or lacking.

Stamens 10; plants often robust or forming ample cushions.

Leaves deeply bisulcate dorsally.....*A. bisulca*.

Leaves not sulcate or not markedly so.

Sepals broadly membranous-margined.

Sepals ovate, obtuse.....*A. pycnophylla*.

Sepals oblong, acuminate.....*A. pycnophylloides*.

Sepals narrowly scarious, ovate-oblong, acutish. *A. boliviana*.

Stamens 5; diminutive plants 1–5 cm. high.

Leaves cuspidate; capsule included.....*A. alpamarcae*.

Leaves acute; capsule exserted.....*A. pedunculosa*.

Sepals not inflexed; styles usually 3–4; plants sometimes densely matted but not infrequently lax and open in habit.

Staminal disk conspicuous, lobed; plants glabrate, diffuse; leaves flat; seeds large, lustrous, obsoletely puncticulate. *A. tetragyna*.

Staminal disk ring-like, often obscure; plants frequently tufted or pubescent; seeds smooth or tuberculate.

Fertile stamens 5; seeds roughened (except *A. Orbignyana*).

Roots not at all fusiform or tuber-like.

Sepals indurate at the base.....*A. nitida*.

Sepals not indurate.

Petals none; seeds granulate.....*A. andina*.

Petals present; seeds smooth.....*A. Orbignyana*.

Roots fusiform, tuber-like.....*A. crassipes*.

Fertile stamens 10; seeds smooth, lustrous; sepals not indurate.

Plants more or less densely pulvinate-cespitose or, if diffuse, low and with creeping-assurgent stems or branches.

Flowers 3–5 together, involucrate by the uppermost leaves. *A. Mandoniana*.

Flowers solitary but often only in the upper axils.
Leaves awl-like, more or less pungent and rigid; flowers subsessile in the upper axils.
Petals present.
Petals and sepals subequal; leaves pungent-aristate. *A. aphanantha.*
Petals much shorter than the sepals, leaves acute. *A. Standleyi.*
Petals none..... *A. Jamesoniana.*
Leaves not awl-like, soft; flowers often scattered and conspicuously pediceled.
Calyx lobes acute..... *A. parvifolia.*
Calyx lobes obtuse..... *A. digyna.*
Plants typically lax and open, with strongly ascending or erect stems and branches.
Flowers few to several, borne terminally in a loose or cymose inflorescence.
Sepals oblong, the petals slightly longer.. *A. Poeppigiana.*
Sepals ovate, distinctly exceeded by the petals. *A. Stuebelii.*
Flowers solitary, axillary.
Sepals 4.5–5.5 mm. long..... *A. soratensis.*
Sepals 2.5–4 mm. long.
Sepals much exceeded by the petals.... *A. megalantha.*
Sepals and petals subequal..... *A. lanuginosa.*

Arenaria alpamarcae Gray, Bot. U. S. Expl. Exped. 116. 1854.

Glabrous and cespitose, forming pulvinate tufts a few cm. high; leaves crowded or imbricate but somewhat spreading, ovate-lanceolate, 4–6 mm. long, rigid, carinate-cuspidate, the margins thickened and smooth or very obscurely ciliate near the connate base; peduncle 2–4 mm. or in fruit 6–10 mm. long, 1-flowered; sepals usually 5, resembling the leaves, 3–4 mm. long; petals apparently none; capsule rather shorter than the calyx, usually 6-valved to the base; ovules about 20, the seeds 5 or 6, globular, smooth.—Mattfeld (in herb.) reduces this to *A. nitida.*

Junín: Alpamarca (*Wilkes Exped.*, type). Also above Baños and Obrajillo (Dept. Lima).

Arenaria andina Rohrb. Linnaea 37: 255. 1872; 372.

Similar to *A. Orbignyana*; leaves slightly aristate, thin at the base, glabrous, 5 mm. long, 1–1.5 mm. broad; pedicels glabrous, 1.5 mm. long; calyx lobes ovate-oblong or oblong, obtusish, yellow, 2.5–3 mm. long; capsule nearly exserted; seeds elegantly striate-granulate. Neg. 27727.

Peru: (Probably). Bolivia.

Arenaria aphanantha Wedd. Ann. Sci. Nat. V. 1: 293. 1864.

Cespitose, rather openly branched, the diffuse stems often rooting at the nodes; leaves laxly imbricate, subcoriaceous, narrowly lanceolate, aristate, glabrous or toward the base ciliate, 3–4.5 mm. long; flowers solitary, subsessile among the upper leaves; calyx glabrous, the lanceolate, very acute lobes 3 mm. long equaling or slightly shorter than the oblong, obtuse, entire petals; stamens 10; capsule ovate-oblong; seeds minute, acutely grooved dorsally.—Omitted by Williams; by Rohrbach placed between *A. dicranoides* and *A. boliviana*, with the remark, "in habit and character strongly accedes to *Stellaria laevis* (Bartl.) Rohrb. but is distinguishable in the narrower, less imbricate leaves, very acute sepals, and form of the petals."

Andes of Peru: (*Gay 1776*, type).

Arenaria bisulca (Bartl.) Rohrb. Linnaea 37: 248. 1872. *Cherleria bisulca* Bartl. in Presl, Rel. Haenk. 2: 12. 1831.

Diffuse, much branched, finely puberulent, the stems to 10 cm. long, the ascending flowering portion sparsely pubescent; leaves lanceolate, acutely mucronate, lustrous, marked by 2 deep, narrow grooves, the thick margin shortly setulose-ciliate, nearly amplexicaul; calyx coriaceous, lustrous, the ovate-acuminate, lanceolate sepals glabrous; petals linear-oblong, emarginate, twice as long as the calyx: styles 2–3; capsule included, with 6–10 seeds.

Huánuco: Montaña (*Haenke*). Argentina(?).

Arenaria boliviana Williams, Proc. Journ. Linn. Soc. 33: 425. 1898. *A. conferta* Wedd. Ann. Sci. Nat. V. 1: 293. 1864, not Boiss.

Stems often densely pulvinate, cespitose, much branched, the short branches glabrous, clothed below with old leaves; leaves minute, oblong-lanceolate, subacute, narrowly scarious-margined, ciliate, sometimes hispid throughout; flowers solitary, terminal, sometimes few in the upper axils; pedicels hispid, twice longer than the calyx, 6 mm. long; sepals ovate-oblong, obtusish, green or scarcely scarious-

margined; petals none; capsule sometimes slightly exserted; seeds brown, lustrous, smooth. Neg. 27726.

Junín: Cerro de Pasco, 4,400 meters, *Weddell.* Bolivia.

Arenaria caespitosa Muschl. Bot. Jahrb. 45: 449. 1911.

Diffuse, with weak, procumbent, branching stems 3–6 cm. long, these more or less angled and pubescent above; leaves linear- or rarely ovate-lanceolate, thin or fleshy, mostly much longer than the internodes, acuminate or submucronulate, narrowed to an almost petiolar base, 5–10 mm. long, 2–4 mm. wide, somewhat puberulent at the base and on the nerves; flowers axillary on filiform, spreading, densely puberulent or rarely glabrous pedicels 1.5–2 cm. long, in fruit curving to the apex; sepals ovate-oblong, green-carinate, acuminate, puberulent-scabrous, sometimes ciliate, scarious-margined, 3–4 mm. long, slightly exceeded by the oblong-oval, obtuse petals, or these wanting; anthers pale yellow; styles 3; capsule usually a little longer than the calyx, 6-valved, 8-seeded, the seeds smooth, lustrous.

Cajamarca: Ocros (*Weberbauer 2796*, type).

Pycnophyllum carinatum Muschl. Bot. Jahrb. 45: 457. 1911.

Densely cespitose, densely leafy, the stems 4–5 cm. long, with slender branchlets, glabrescent; leaves ovate to lanceolate, very acute, thickly keeled, glabrous and lustrous but minutely ciliate-margined, deeply concave; pedicels slender, glabrate or scaly-pulverulent, 3–4 mm. long; sepals broadly ovate or roundish, scarious, entire, nerved; petals apparently lacking; fertile stamens to 3 mm. long, slightly exceeded by the elongate style; stigmas 3.—A species of *Arenaria*, section *Dicranella*, fide Mattfeld. Cf. *A. boliviana* Williams.

Arenaria crassipes Baehni & Macbr., sp. nov.

Radix crassa fusiformis 4 cm. longa ad apicem 4–6 mm. crassa; caulibus 7–12 prostratis simplicibus 3–5 cm. longis glabris vel glabratis laxe foliatis, internodiis 3–4 mm. longis; foliis suboblongis breviter acuminato-apiculatis 5–7 mm. longis 2–2.5 mm. latis subcoriaceis vel demum membranaceis laxis haud sulcatis marginem versus pilosis vel toto margine piloso-ciliatis, demum glabratis; floribus terminalibus circa 5–7 in apice ramorum fere umbellato-congestis, pedicellis circa 4 mm. longis leviter curvatis; sepalis anguste lanceolato-acuminatis circa 3 mm. longis glabris haud vel angustissime marginatis planis ad basin obscure induratis; staminibus 5; petalis nullis; seminibus puncticulatis.—With much the

habit of *A. nitida* but remarkable in its tuber-like root that resembles in shape a small carrot. It differs also in the complete absence of petals.

Lima: Prostrate on upland slopes, 3,000 meters, Río Blanco, *Macbride 812*, type in Herb. Field Museum.

Arenaria dicranoides HBK. Nov. Gen. & Sp. 6: 34. 1823. *Pycnophyllum dicranoides* Muschl. Bot. Jahrb. 45: 454. 1911.

Cespitose, the crowded, densely leafy stems a few cm. high, glabrous except the ciliate, ovate-lanceolate, acute or obtusish leaves, these imbricate in 4 rows, 3–4 mm. long; flowers sessile at the branchlet tips; sepals oblong, acute, subequal, exceeded by the spatulate petals; styles 2; ovules 4.—The leaves of the older stems are mostly triangular-lanceolate and more or less acute, those of the younger branches rather ovate and obtuse. The specimen from Alpamarca has smaller and blunter leaves and might be referred to *A. bryoides* Willd., but I can not draw any line between the different forms. A cushion-like or tufted plant, it simulates *Distichia* except for the shorter, awl-like leaves.

Puno: (*Meyen;* det. Walpers as *A. bryoides*).—Junín: Near Yauli, 4,500 meters *Weberbauer 5120, 221* (det. Muschler). Cerro de Pasco (*Mathews 688*). Near Casa Cancha, Culnai, and Alpamarca (*Wilkes Exped.*). Ecuador; Bolivia.

Arenaria digyna Schlecht. Ges. Naturf. Berl. Mag. 7: 201. 1813. *A. scopulorum* HBK. Nov. Gen. & Sp. 6: 31. 1823. *A. serpens* HBK. op. cit. 32. *A. serpylloides* Naud. in Gay, Fl. Chile 1: 271. 1845.

Procumbent to suberect, diffuse, much branched, the branchlets glabrous or rarely hirsutulous; leaves 1-nerved, thin or somewhat fleshy, glabrous or puberulent or marginally and dorsally ciliate, scarcely over 6 mm. long, 1 mm. wide; flowers solitary, erect, the glabrous or pubescent pedicels usually only 2–3 mm. long; calyx often as long, glabrous or rarely sparsely hirsute, the oblong-obtuse lobes a little shorter than the ovate-oblong, obtuse, entire petals; seeds 2–3, lustrous, smooth; capsule elliptic, scarcely 2 mm. long, slightly exserted.—*A. parvifolia* Benth. has leaves 4–8 mm. long, 1–3 mm. wide, petals none or shorter than the often puberulent calyx. The Humboldt specimen in Herb. Berlin is pubescent, the leaves acute.

Cajamarca: Micuipampa, *Humboldt*, type of *A. scopulorum*.—Lima: Casa Cancha, a little distance below snow (*Wilkes Exped.;*

det. Gray as *A. scopulorum*). Baños (*Wilkes Exped.;* det. Gray). Junín: Cerro de Pasco, *Mathews.*—Puno: Near Poto, 4,600 meters *Weberbauer* (as *A. serpylloides*). Lake Titicaca region, 3,919 meters, *Mandon 963*, det. Rohrb.—Cuzco: Prov. Canchis, Sicuani, 3,550 meters (*Hicken*). Chile to Bolivia and Mexico.

Arenaria Engleriana Muschl. Bot. Jahrb. 45: 449. 1911.

A pulvinate perennial with weak, procumbent, diffuse, but never rooting stems 3–6 cm. long, the branches more or less angled and pubescent toward the tip; leaves usually ovate-lanceolate, acute or mucronulate, broadly truncate at the sessile base, where puncticulate and puberulent-scabrous on the nerves, lightly ciliate, usually thick, 5–10 mm. long, 2–5 mm. broad; pedicels filiform, spreading, densely puberulent, in fruit curved, 1 cm. long; sepals ovate-oblong, green-keeled, acuminate, slightly scabrous, the broadly scarious margin somewhat ciliate, 3–4 mm. long; petals lanceolate, obtuse, often slightly longer than the calyx; anthers pale yellow; styles 3; capsule often slightly exserted, with 8 smooth, lustrous seeds.

Junín: Between Tarma and Oroya (*Weberbauer 2542*, type).

Pycnophyllum horizontale Muschl. Bot. Jahrb. 45: 454. 1911.

Stems densely cespitose, tortuous, about 7 cm. long, glabrate, the many branches often rooting; leaves linear- or rarely ovate-lanceolate, acute, scarious, lustrous, glabrous except the ciliate margins, densely and quadrately imbricate but horizontally spreading; flowers apical, sessile; sepals lanceolate or ovate, scarious, acute, about equaled or slightly exceeded by the oblong-linear petals; anthers elliptic, red; style trifid apically; ovules 3–4, affixed to a central placenta; capsule 3-valved.—This is a species of *Arenaria*, section *Dicranella*, according to Mattfeld. Cf. *A. aphanantha* Wedd.

Lima: Andes above Lima, 4,500 meters (*Weberbauer*, type).

Arenaria lanuginosa (Michx.) Rohrb. in Mart. Fl. Bras. 14, pt. 2: 274. *pl. 63*. 1872. *Spergulastrum lanuginosum* Michx. Fl. Bor. Amer. 1: 275. 1803. *Stellaria lanuginosa* Torr. & Gray, Fl. N. Amer. 1: 187. 1838. *A. nemorosa* HBK. Nov. Gen. & Sp. 6: 35. 1823. *A. diffusa* Ell. Sketch. Bot. Car. & Georgia 1: 519. 1821. *Stellaria laxa* Muschl. Bot. Jahrb. 45: 443. 1911.

More or less densely hirsutulous to glabrescent, the diffuse, weak stems sulcate or angled above; leaves linear to lanceolate, usually acutish, 5–30 mm. long, 2–5 mm. broad, puncticulate or slightly scabrous; flowers solitary, axillary on filiform, spreading,

densely puberulent pedicels 1.5–3 cm. long; sepals ovate-oblong, carinate, acuminate, the green keel scabrous, the scarious margin sometimes ciliate, 2.5–4 mm. long; petals typically lacking but usually shorter than the calyx; stamens 10; capsule slightly longer than the calyx, 8-seeded; seeds smooth, lustrous, spheroid-lenticular. —Very variable in leaf form and degree of pubescence (Rohrbach). Used as an astringent for hemorrhages of the uterus (*Herrera*).

Lima: Viso, in limestone slide rock, *766*. Matucana, *Weberbauer 153; 167* (type of *Stellaria laxa*). Baños, Obrajillo, and Culnai (*Wilkes Exped.;* det. Gray, using the name *A. diffusa*).—Huánuco: Cochero, *Poeppig 1402b*. Mito, *1744, 1844*. Panao, *3619*.—Ayacucho: Prov. Huanta, 2,600 meters, *Weberbauer 5603*. Carrapa, 1,200–2,500 meters, open or wooded hillsides, *Killip & Smith 22295, 22421*.—Amazonas: Chachapoyas, *Mathews 2098*.—Cuzco, Sacsahuamán, 3,600 meters, *Herrera 2354, 2177*. Pillahuata, 2,500 meters, in thickets, *Pennell 13995*. Machupicchu, 2,200 meters, *Herrera 3250*. Huarocondo, 3,200 meters, *Herrera 3627a*. Cuzco, *Soukup 78*. San Sebastián, *Pennell 13614*.—Puno: Tabina, *Lechler 1889*.—Junín: Huacapistana, 1,800–2,400 meters, thickets and open woods, *Killip & Smith 24122*. Chanchamayo Valley, 1,500 meters, *Schunke 350, 383, 486*.—San Martín: San Roque, 1,400 meters, *Williams 7453*.—Without locality: *Ruiz & Pavón* (det. Mattfeld). Bolivia, north in the Andes to Mexico and southeastern United States. "Celedonia," "tauchchalli."

Arenaria Mattfeldii Baehni, sp. nov.

Perennis, dense caespitosa, 3–5 cm. alta; folia 1.5–2 mm. longa, spiraliter disposita, 4 series parallelos efformantia, imbricata, crassiuscula, subtriangulata, apice obtusa, margine ciliata et paululum involuta; flores brevissime pedicellati, ex foliis inferioribus exserti, apetali; sepala 2 mm. longa, subtriangularia, crassiuscula, ad basin gibbosa, apice recurvata; discus conspicuus, carnosus; stamina 10 sepala aequantia; ovarium 0.75–1 mm. longum, glabrum, seminibus 8; styli 2 usque ad basin distincti.—This little plant has the appearance of a *Pycnophyllum*.

Junín: Yauli, above the Hacienda Arapa, near the Lima-Oroya railroad, *Weberbauer 353* (type, in Herb. Deless.).

Arenaria nitida (Bartl.) Rohrb. Linnaea 37: 249. 1872; 375. *Cherleria nitida* Bartl. in Presl, Rel. Haenk. 2: 12. 1831.

Stems weak, procumbent at the base; leaves ovate, mucronate, basally connate, plane, coriaceous, glabrous, lustrous, remotely

bisulcate beneath, 4–7 mm. long; flowers subterminal; calyx glabrous, coriaceous, turbinate; sepals lanceolate, acute, not sulcate; stamens 5, with 5 staminodia; petals half as long as the calyx, linear-oblong, subacute or subemarginate, attenuate to the base; capsule narrow; seeds nearly globose, seriate-tuberculate.

Junín: Yauli, 4,200 meters, *902* (det. Mattfeld). Mount La Juntai, 4,700 meters, *Killip & Smith 22107* (det. Mattfeld). Near Tarma, 4,500 meters, *Killip & Smith 21953*. Lima: Obrajillo (*Haenke*, type).

Arenaria Orbignyana Wedd. Ann. Sci. Nat. V. 1: 293. 1864; 384.

Diminutive, the diffuse or creeping, pulverulent or glabrous stems only 1–5 cm. long; leaves thickish, somewhat imbricate, nearly spatulate-lanceolate, acute, serrulate-ciliate especially toward the base, 3–4 mm. long, 1–1.5 mm. broad; flowers solitary, terminal, shortly pediceled; calyx lobes ovate-lanceolate, obtusish, scarious-margined, glabrous, 4 mm. long, scarcely equaled by the obovate-lanceolate, obtuse petals; capsule ovate-oblong, included, dehiscent by 3 biparted valves; seeds globose, reniform, lustrous.—Description by Rohrbach, from *Orbigny 1511*, as represented in Herb. DC. Weddell describes the plant as glabrous, flowers sessile, and petals longer than the calyx. The calyces are notably large for the size of the plant. Neg. 27730.

Cuzco: Chuquibambilla, *Pennell 13392*. Sacsahuamán, 3,600 meters, *Herrera 2384*. Paucartambo Valley, *Herrera 2325*. Bolivia.

Arenaria pallens Muschl. Bot. Jahrb. 45: 450. 1911.

A densely pulvinate annual with diffuse, procumbent stems 2–4 cm. long, the more or less sulcate or angled stems and branches glabrous; leaves usually linear-lanceolate, thick or rigid, very acute or mucronate, 5–8 mm. long, 2–3 mm. broad, petiolate, on the nerves and at the base puberulent, ciliate; pedicels filiform, spreading, 1 cm. long, becoming glabrate, curved in fruit; sepals oblong-ovate, green-carinate, puberulent, the broadly scarious margins mostly ciliate, 3–4 mm. long, the mostly ovate petals usually a little longer; otherwise like *A. Engleriana*.

Junín: Near Yauli, 4,400 meters (*Weberbauer 267*).

Arenaria parvifolia Benth. Pl. Hartw. 163. 1839; 382.

Greatly resembling *A. digyna*, but the leaves often proportionately broader, ovate or lanceolate-spatulate, more or less pubescent

or glabrous except the midnerve beneath, with the petiole 4–8 mm. long, 1–3 mm. broad.

Peru: Without locality, *Ruiz & Pavón.* North to Mexico.

Pycnophyllum peruvianum Muschl. Bot. Jahrb. 45: 457. 1911.

Stems 3–4 cm. long, densely cespitose, densely leafy, glabrous; leaves lanceolate or narrowly so, very acute, fleshy or rigid, densely ciliate-margined, otherwise glabrous, lustrous; pedicels 0.5 mm. long, glabrous; sepals linear- to ovate-lanceolate, scarious, acutish, nerved; petals narrowly ovate; fertile stamens 2–3 mm. long, the style slightly longer; seeds triangular, compressed, lustrous.—Belongs to *Arenaria*, section *Dicranella*, according to Mattfeld.

Junín: Near La Oroya, 430 meters (*Weberbauer 2597*, type).

Scleranthus peruvianus Muschl. Bot. Jahrb. 45: 460. 1911.

A densely cespitose perennial, with many ascending, slightly branched, glabrous stems 6–10 cm. long, clothed below with dead leaf bases; leaves dilated at the base, linear to lanceolate, plano-convex, densely ciliate-margined, glabrous, 6–7 mm. long, 1–2 mm. broad; flowers subsessile, in loose cymes; sepals oblong to ovate, the midnerve thick, mostly glabrate; petals 5, subulate, about as long as the sepals; stamens 5, the filaments strongly dilated at the base.—This plant is a species of *Arenaria*, according to Mattfeld in Herb. Berlin.

Cajamarca: Above Hualgayoc, 4,000 meters (*Weberbauer 3985*, type).

Arenaria Poeppigiana Rohrb. Linnaea 37: 265. 1872.

Closely allied to *A. lanuginosa*, but the quadrangular stems with many short, sterile, very leafy branchlets, a few elongate, ascending-erect, floriferous at the apex, 5–20 cm. high; pubescence of simple and stellate trichomes intermixed; sepals acutish, green, narrowly scarious-margined, the outer puberulent, the inner glabrescent except the hirsutulous nerve.—*A. soratensis* Rohrb. op. cit. 266, has ovate-lanceolate leaves 3–4 mm. broad and long-acuminate sepals, scarious-ciliate, green, the nerve scabrous, shorter than the petals. *A. Jamesoniana* Rohrb. op. cit. 267, with leaves scarcely 1 mm. broad, calyx lobes acuminate, puberulent, petals none, capsule half as long as the calyx, the plant glabrescent, may occur. Neg. 27731.

Huánuco: Casapí, *Poeppig 1402a* (type). Huacachi, rock pockets, *3867*. Huallaga, 1,600 meters, *Weberbauer 6814*.

Arenaria pycnophylloides Pax, Bot. Jahrb. 18: 29. 1893.

Glabrous or more or less ciliate; leaves lanceolate, acuminate, lustrous, subcoriaceous, densely ciliate to the apex and on the prominent midnerve beneath, above more or less concave; sepals oblong, acuminate, ciliate, broadly thin-margined; petals obtuse, minute or wanting; ovary depressed-globose; styles 3.—Stems greatly abbreviated, densely imbricate-leafy, forming low cushions (var. *compacta* Pax); var. *Moritziana* Pax ex Williams has longer branches, leafless below, and eciliate leaves and sepals.

Junín: Cerro de Pasco, *Ruiz & Pavón* (det. Mattfeld as "aff."). Colombia; Argentina.

Alsine rupestris Muschl. Bot. Jahrb. 45: 448. 1911.

Densely pulvinate, with many ascending or rarely decumbent, usually simple, glabrous stems 3–10 cm. long; leaves lanceolate or often ovate, with an amplexicaul base, acute, densely scaly-puberulent or glabrate, ciliate, many-nerved, scarcely 8 mm. long, 2–3 mm. wide; pedicels 5 mm. long, erect, more or less curved beneath the calyx, rather densely spreading-puberulent or glabrate, as also the green, oblong sepals, these 3.5–5 mm. long; petals ovate-cuneate, 4.5 mm. long, equaling the capsule; seeds minutely tuberculate.

Puno: Above Ananco, 5,100 meters (*Weberbauer 1042*, type).

Arenaria soratensis Rohrb. Linnaea 37: 266. 1872.

Similar in habit to *A. lanuginosa*, but with stouter stems and firmer foliage, the former ashy-puberulent, the latter less so, drying yellowish green; leaves ovate-lanceolate, to 1 cm. long, 3–4 mm. broad, the lower imbricate; pedicels spreading or curved below the calyx, 10–20 mm. long; sepals ovate-lanceolate, long-acuminate, the narrow apex recurving; petals ovate-oblong, obtuse, slightly exserted; capsule included; seeds lenticular, smooth, lustrous. Neg. 27732.

Peru: (Probably). Bolivia.

Arenaria Standleyi Baehni & Macbr., sp. nov.

Caespitosa ramosissima; caulibus e radice repente numerosis brevibus dense fastigiatis 1–2 cm. altis; foliis imbricatis ovato-lanceolatis subcoriaceis acutis obscure pungentibus vix 3 mm. longis circa 1 mm. latis plus minusve involutis ad marginem inferne minutissime ciliatis; floribus solitariis inter folia suprema ramorum; sepalis 2.5–3 mm. longis acutis paullo inflexis; petalis obovato-ellipticis 1 mm. longis calyce multo brevioribus; staminibus 10, disco obscuro.—Apparently nearly *A. aphanantha* Wedd., which, however,

has subequal petals and sepals and aristate-pungent leaves. The styles are either 2 or 3.

Ayacucho: Forming small, flat cushions in rocks, Mt. Razuhuillca, Prov. Huanta, 4,200 meters, *Weberbauer 7489*, type, Herb. Field Museum.

Arenaria Stuebelii Hieron. Bot. Jahrb. 21: 307. 1895.

Stems numerous, ascending-erect, little branched unless at the base, to 10 cm. high, more or less minutely hirsutulous-puberulent; leaves glaucous, linear-lanceolate, acute or subacuminate, minutely puberulent and marginally scabrous, about 8 mm. long, 1 mm. broad; pedicels erect, to 1.5 cm. long; sepals ovate, scarious-margined, the outer acuminate, ciliate at the base, scabrous, 3.5–4 mm. long, the interior obtuse, mucronate; petals ovate-oblong, obtuse, 6.5 mm. long, 3 mm. wide; ovary ovate.

Peru: (Probably). Bolivia.

Arenaria tetragyna Willd. ex Schlecht. Ges. Naturf. Berl. Mag. 7: 201. 1813.

Much branched, creeping or ascending, diffuse, glabrous or sparsely pilose; leaves more or less approximate, pale green, plane, oblong-lanceolate, acutish or obtuse, membranous, scarcely narrowed to the base, very shortly ciliate, 6–10 mm. long, 1.5–2 mm. broad; flowers solitary at the branchlet tips, often long-peduncled; sepals obtuse, narrowly scarious-margined, glabrous, 3.5–4 mm. long; petals ovate-elliptic, short-clawed, shorter than the calyx; capsule tardily dehiscent, equaling the calyx; seeds large, obsoletely punctulate.—Some at least of the material in herbaria as *A. serpens* HBK. matches our plant exactly, and is rather referable to *A. tetragyna* because of the disk glands.

Peru: (*Dombey*).—Lima: Río Blanco, 5,000 meters, *3019*.—Cuzco: Raya, 4,350 meters, *Pennell 13528*. Chile; Ecuador; Mexico.

Alsine Weberbaueri Muschl. Bot. Jahrb. 45: 448. 1911.

Densely pulvinate, with an indurate caudex, the soon glabrous, closely leafy stems 2–4 cm. long; leaves linear or linear-lanceolate, narrowed to a petiole, acute, the younger pubescent on both sides and often ciliate, many-nerved, thick, 10–15 mm. long, 0.5–2 mm. wide; pedicels filiform, 1 cm. long, more or less curved below the calyx, somewhat puberulent or sometimes glabrous; sepals oblong, 3–5 mm. long, the ovate, cuneate petals about as long as the capsule.

Lima: At 4,500 meters above Lima (*Weberbauer 5160*, type).

6. PYCNOPHYLLUM Rémy

Plettkea Mattf.; *Pycnophyllopsis* Skottsb.

Reference: Mattfeld, Repert. Sp. Nov. 18: 167–179. 1922.

Characteristically cushion plants, sometimes small and then distinguished in flower from a few species of *Arenaria* only by the presence of 1–4 ovules instead of several in the 1-celled ovary, the fruit a utricle. Leaves small or minute, bract-like, densely imbricate in rows or spiraled. Flowers small or nearly minute, terminal or apparently lateral, often concealed by the bracts. Styles 2–3, entirely free (*Plettkea*, *Pycnophyllopsis*), free nearly to the base (*P. Lechlerianum*), or more or less united (remaining species). Receptacle infundibuliform (*Plettkea*) or campanulate, with a truncate or somewhat sunken base (*Pycnophyllopsis*), the ovary in the former case more or less sunken in the tube.—The species with completely divided styles approach in this single character some genera of the Alsineae and are more closely allied than indicated by Pax and Hoffmann to *Habrosia* and *Scleranthus*, which, however, are totally different in aspect. Therefore, logical though Mattfeld's segregation of *Pycnophyllum* may be (see Pflanzenfam. ed 2. 16c: 367. 1934), it seems to serve no useful purpose in floristic or phytogeographic work, and accordingly is not accepted here, where the convenience of a single group name for these often conspicuous cushion plants of the high Andes is a first consideration. In monographic work, where a prime intent is to show relationship in development, *Plettkea* could and perhaps should be maintained as either a generic or sectional entity. To avoid duplication of a specific name, one transfer is made. Besides the following, *Pycnophyllopsis keraiopetala* Mattf. op. cit. 22, may be expected; it is distinguished from *P. glomeratum* Mattf. by its oblong-lanceolate, ciliate leaves and 3 completely divided styles.

Leaves scarious, orbicular, apiculate, appressed; branches mostly only 8–15 mm. long, 2 mm. thick..... *P. Aschersonianum.*

Leaves not as above, at least not in all respects.

Leaves more or less spreading, at least the tips of the upper aristate, scarious.

Leaves all spreading, the tips filiform, curling.... *P. aristatum.*

Leaves aristate, but abruptly, the points straight. *P. Holleanum.*

Leaves all closely appressed or not scarious and not aristate.

Leaves scarious (thin) or orange-colored and scarious-margined, often conspicuously calloused; petals present.

Flowers 4–5.5 mm. long; leaves not orange-colored in age.

Leaves constricted below the middle, minute, orbicular, neither apiculate nor notably calloused; branchlets club-shaped; petals well exserted . . . *P. macropetalum.*

Leaves not constricted below the middle.

Leaves lightly calloused; branchlets not or scarcely club-shaped; sepals broadly obovate . . . . . *P. molle.*

Leaves conspicuously calloused; branchlets filiform; sepals obovate . . . . . *P. Markgrafianum.*

Flowers 3–4 mm. long; leaves orange-colored in age. *P. bryoides.*

Leaves opaque, firm, not at all scarious or not orange-colored.

Branches not quadrate, slender, all but the ultimate about 2 cm. long; leaves loose; styles nearly 3-parted; petals none . . . . . *P. Lechlerianum.*

Branches quadrate, the lower often only about 1 cm. long; styles completely separated, 2–3; petals present.

Leaves straw-colored in age, 5–7 mm. long, clearly spiraled.

Sepals 5; styles 3; ovary almost completely immersed in the calyx base . . . . . *P. macrophyllum.*

Sepals 4; styles 2; ovary partly immersed in the calyx base . . . . . *Plettkea cryptantha.*

Leaves about 2.5 mm. long, not clearly spiraled.

Flowers 3.5–4 mm. long; leaf cilia 1-celled . . *P. Mattfeldii.*

Flowers 2.5 mm. long; leaf cilia 2-celled . . *P. Weberbaueri.*

Branches short, quadrate; leaves not clearly spiraled; styles united; petals none.

Branches 1.5–2 mm. thick.

Branchlets 5–18 mm. long, few . . . . . *P. tetrastichum.*

Branchlets 3–4 mm. long, many . . . . . *P. glomeratum.*

Branches very slender, 1 mm. thick.

Flowers 2.5 mm. long; branches 1 mm. thick. *P. filiforme.*

Flowers 4–4.5 mm. long; branches nearly 1.5 mm. thick. *P. leptothamnum.*

Pycnophyllum aristatum Mattf. Repert. Sp. Nov. 18: 178. 1922.

Closely allied to *P. Holleanum,* but the awns of the ovate leaves 3–5 mm. long, the bracts sheathed and lightly calloused, the petals 3 mm. long.

Ancash: Mt. Ururupay, Prov. Pallasca, in nearly sterile stone slides, 4,800 meters, *Weberbauer 7250.* Cabrococha, 4,600 meters, *Weberbauer.*

Pycnophyllum Aschersonianum Muschl. Bot. Jahrb. 45: 455. 1911.

Densely cespitose; branches apically enlarged, very densely leafy; leaves opposite, concave, 3–4-seriate, orbicular-obovate, rarely 1 mm. broad, 2–3 mm. long.—According to Mattfeld, op. cit. 179, this species, so far as Muschler's description of the flowers is concerned, is based on his well known imagination, the type material being sterile. However, the species appears to be closely related to *P. molle* and *P. spathulatum.*

Ancash: Vicinity of Huaraz, 4,500 meters, *Weberbauer 3293* (type).

Pycnophyllum bryoides (Phil.) Rohrb. Linnaea 36: 662. 1870. *Stichophyllum bryoides* Phil. Fl. Atac. 19. *pl. 1.* 1860.

Stems numerous, much branched, to 15 cm. high, the branchlets scarcely enlarging apically; leaves ovate-lanceolate, acuminate, broadly scarious-margined, minutely serrulate, 2–2.5 mm. long; flowers pedicellate; calyx 3 mm. long, the lanceolate, obtuse lobes scarious, longitudinally nerved; petals 5, oblong-linear, bifid nearly to the base, the lanceolate divisions very acute, nearly 2 mm. long, about equaled by the fertile stamens; style simple, the stigmas 3.—Peruvian specimens have flowers 4–4.5 mm. long (Mattfeld).

Arequipa: Nearly sterile, sandy slopes, eastern side of Mt. Misti, 4,400 meters, *Weberbauer 1420;* 218 as *P. argentinum* Pax.—Puno: Picutani, 4,400 meters, *Weberbauer 501b.* Chile.

Plettkea cryptantha Mattf. Schrift. Ver. Nat. Unterweser N. F. 7: 15. 1934.

Pulvinate, the woody branches flabellately branching, the older naked, 3 mm. thick, the younger, with the spirally imbricate leaves, 5 mm. in diameter, the ultimate in pairs with a solitary flower concealed in the tip; leaves ovate-lanceolate, amplexicaul, acute, mucronulate, coriaceous, the margins ciliolate above, 5–6 mm. long, about 3 mm. broad at the base; flowers sessile, perfect, tetramerous, 5.5 mm. long; receptacle infundibuliform, to 1.5 mm. high; sepals 4 mm. long, the outer oblong, ciliolate, the inner ovate or elliptic, glabrous; petals scarcely 2 mm. long, parted nearly half their length, broadly obovate; styles 2, not at all joined outside the ovary wall, the ovary itself half sunken in the receptacle; ovules 4.

Junín: Morococha (*Raimondi;* type of the genus *Plettkea*).

Pycnophyllum filiforme Mattf. Repert. Sp. Nov. 18: 172. 1922.

Forming large cushions, the much branched branches filiform, 1–1.5 mm. thick; leaves rarely spiraled, the white, membranous sheaths 0.5–0.8 mm. broad, toward the base scarious-margined and minutely papillose, calloused, mucronulate, 2 mm. long; flowers dioecious, the staminate 2.5 mm. long, exceeded by the ovate bracts; sepals ovate-elliptic, with oblong callus, 3-nerved.

Arequipa: Lake Villafro, 4,700 meters, *Weberbauer 6885.*

Pycnophyllum glomeratum Mattf. Repert. Sp. Nov. 18: 171. 1922.

Branches and branchlets erect, short, about 5 cm. long, the ultimate pulvinate or glomerulate; leaves densely imbricate, opposite, decussate or often spiraled; sheaths glabrous, infundibuliform, to 1.2 mm. long; leaf blade broadly ovate, about as long, membranous-margined, mucronulate, cymbiform-concave; bractlets 3 mm. long; flowers dioecious, the staminate cylindric, not at all gibbous, 4 mm. long; sepals 3-nerved from the base; pistillate flowers similar, with sterile stamens; style 1 mm. long, with branches 0.2 mm. long; seeds 1–2, minutely reticulate.—To be expected is *P. Stuebelii* Mattf. of Bolivia with the leaves 3–3.5 mm. long, including the half shorter sheath, this densely short-papillose; branchlets about 12 cm. long.

Puno: Picutani, 4,400 meters, *Weberbauer 501a* (type). Sandía, near Poto, 4,600 meters, *Weberbauer 952;* 219, as *P. convenum* Griseb.—Cuzco: Below glaciers of Auzangate, *Weberbauer 7774* (det. Mattfeld).

Pycnophyllum Holleanum Mattf. Repert. Sp. Nov. 18: 177. 1922.

Stems ligneous, the erect, flabelliform branches to 20 cm. long, 2 mm. thick; leaves densely spiraled, obovate, 2.5 mm. long, abruptly awned, the awn 0.5–1 mm. long; upper bracts ecallose; petals retuse, 1.8 mm. long, the broadly obovate sepals 5 mm. long.

Junín: Prov. Huancayo, above Hacienda Acocarpa, 4,900 meters, *Weberbauer 6522.*

Stellaria laevis (Bartl.) Rohrb. Linnaea 37: 275. 1872. *Cherleria laevis* Bartl. in Presl, Rel. Haenk. 2: 12. 1831.

A nearly glabrous perennial, much branched from the base, the many diffuse stems covered below with dead leaves; leaves 4–6 mm. long, coriaceous, lustrous, ovate, connate at the base, acutely

acuminate, mucronulate, ciliolate; flowers solitary at the tips of the branches, sessile; sepals scarcely 2 mm. long, oblong-lanceolate, obtusish, faintly 3-nerved; stamens 5; petals mostly bifid, inserted with the 5 stamens in a ring; ovary deep in the calyx; stigmas 3. —Mattfeld, Schrift. Ver. Naturk. Unterweser N. F. 7: 21. 1934, thinks that this belongs to his genus *Plettkea*. There is in Herb. Delessert a scrap of a *Pycnophyllum*-like plant, apparently sterile, and purporting to be by Pavón, which is labeled by Fenzl "*S. lycopodioides* Fenzl," a manuscript name mentioned by Rohrbach. op. cit., as referable to the Presl plant.

Lima: Obrajillo.

Pycnophyllum Lechlerianum Rohrb. Linnaea 36: 664. 1870; 174.

Laxly cespitose, the branches not club-shaped; leaves coriaceous, with a small, medial callus, broadly ovate-lanceolate, attenuate apically, narrowed basally, 6 mm. long; calyx broadly obovoid, strongly enlarged, 3 mm. long; sepals nearly scarious, lanceolate, obtuse, mucronulate; petals none; ovary hexagonous; stigmas 3, parted nearly to the base.—Leaves, according to Mattfeld, membranous. Neg. 29832.

Puno: Azángaro, 3,820 meters, *Lechler 1742* (type).

Pycnophyllum leptothamnum Mattf. Notizbl. Bot. Gart. Berlin 10: 1051. 1930.

With the habit and long, slender stems of *P. filiforme* but in other characters resembling most *P. glomeratum;* leaves slightly if at all spiraled, the sheath 0.8 mm. long, the blade 2 mm. long, softly muticous at the narrowed tip, opaque, straw-colored, obscurely calloused, narrowly scarious; floral bracts 4 mm. long; sepals mucronulate; 1 petal rarely present; style 1.5 mm. long with 3 or sometimes 2 short branches.

Cuzco: In puna near glaciers of Auzangate, 4,600 meters, *Weberbauer 7772* (type).

Pycnophyllum macropetalum Mattf. Repert. Sp. Nov. 18: 176. 1922.

Stems to 15 cm. long, the thicker branches to 3.5 mm. thick toward the tip; leaves densely spiraled, shortly sheathed, the blades obovate, conspicuously constricted below the middle, 2–2.5 mm. long, rounded at the apex, minutely mucronulate, pale straw-colored, obscurely calloused; bracts spatulate, longer than 4 mm., not

calloused; flowers dioecious, the pistillate obovoid, 6 mm. long, the nearly orbicular sepals papillose below the apex, with a green callus 4 mm. long; petals obovate, deeply bifid, 5 mm. long; styles 1.5 mm. long, the branches 0.5 mm. long.—*P. spathulatum* Mattf., to be expected, has obovate, obtuse or denticulate petals to 1.5 mm. long.

Puno: Cerro Tacora, 4,500 meters (*Stuebel 110*, type).

Pycnophyllum macrophyllum Muschl. Bot. Jahrb. 45: 458. 1911; 179. *Plettkea macrophylla* Mattf. Schrift. Ver. Nat. Unterweser N. F. 7: 18. 1934.

With the habit of *Plettkea cryptantha*, and recalling *Lycopodium Selago;* leaves lanceolate or ovate-lanceolate, acuminate, densely ciliate, 5 mm. long; flowers sessile, terminal, 4.5 mm. long, the infundibuliform receptacle 2 mm. deep; sepals ovate, coriaceous, 2–5 mm. long, the slightly shorter petals obovate; ovules about 3.—Description from Mattfeld, op. cit. 18.

Ancash: Huaraz, 4,500 meters, *Weberbauer 2975* (type).

Pycnophyllum Markgrafianum Mattf. Repert. Sp. Nov. 18: 175. 1922.

Similar to *P. molle*, but the sepals obovate or obovate-elliptic, narrowed to the base, and the leaf callus light brown.

Ancash: Prov. Cajatambo, 4,400 meters, *Weberbauer 2783* (type); 224, as *P. molle*.—Lima: At 4,500 meters, at the silver mine Alpamena, *Weberbauer 5121*.

Pycnophyllum Mattfeldii Macbr., nom. nov. *Plettkea tetrasticha* Mattf. Schrift. Ver. Nat. Unterweser N. F. 7: 21. 1934, not *Pycnophyllum tetrastichum* Rémy.

Very similar to *P. Weberbaueri*, but more robust; leaves and flowers slightly longer, the sepals 2.5 mm. long; cilia of the leaves all 1-celled.

Cajamarca: Above Ocros, 4,800 meters, *Weberbauer 2804a* (type).

Pycnophyllum molle Rémy, Ann. Sci. Nat. III. 6: 355. *pl. 20.* 1846; 174. *P. aculeatum* Muschl. Bot. Jahrb. 45: 456. *pl. 1.* 1911.

Stems many, to 20 cm. long, scarcely enlarged toward the tip; leaves spiraled, orbicular-obovate, very blunt, lustrous, scarious-margined, scarcely 2 mm. long; leaf callus green or pale straw-colored; bracts obovate; sepals broadly ovate; petals oblong-linear, not dilated, obtuse, entire or emarginate, bifid or 3-dentate; ovary trigonous; seeds pyriform, smooth.—Flowers 4.5–5.5 mm. long;

leaves of the Peruvian plant less densely imbricate (Mattfeld). Illustrated, Weberbauer 205.

Puno: Sandía, stony ground near Poto, 4,400 meters, *Weberbauer 946, 950;* 219. Tacora, 4,500 meters, *Stuebel 109.*—Arequipa: Vincocaya, 4,100 meters, *Weberbauer 1374;* 205 (type of *P. aculeatum*). Nevado de Chachani, 4,400 meters, *Pennell 13315.*—Cajamarca: Ocros (*Weberbauer 224*).—Ancash: Huarapasca, 4,900 meters, *2488.*—Moquehua: Carumas, 4,500 meters, *Weberbauer 7315, 7356* (det. Mattfeld). Bolivia.

Pycnophyllum tetrastichum Rémy, Ann. Sci. Nat. III. 6: 356. *pl. 20.* 1846; 172.

Branches erect, forming very dense cushions, the several slender branchlets scarcely if at all enlarged apically; leaves narrowed to the apex, gradually convex-curved, the callus not definitely defined, broadly ovate, 4–5 mm. long; calyx 4.5 mm. long, the ovate-oblong sepals acutish, scarious, 3-nerved; petals none; style short-trifid at the apex; ovary trigonous.—Leaves, according to Mattfeld, as short as 2 mm.

Puno: Pisalomo, 4,450 meters, *Meyen.* Lake Titicaca, *Hill 53.* Bolivia.

Pycnophyllum Weberbaueri Muschl. Bot. Jahrb. 45: 455. 1911; 179. *Plettkea Weberbaueri* Mattf. Schrift. Ver. Naturk. Unterweser N. F. 7: 19. 1934.

Stems much branched, forming cushions, to 4 cm. long; leaves ovate or ovate-lanceolate, 1 mm. long, clasping at the base, blunt, mucronulate, subcoriaceous, marginally ciliate, the lower hairs 2-celled, the upper 1-celled; sepals oval, 1.8 mm. long, papillose-ciliolate, about twice longer than the rotund-ovate petals; styles 3-parted to the base; ovules about 3.—Description from Mattfeld, loc. cit.

Arequipa: Vincocaya, 4,100 meters, *Weberbauer 1373,* type.

7. PARONYCHIA L.

Annual herbs or even half shrubby, with sometimes falsely whorled leaves. Flowers few, usually axillary, often concealed by the large stipules. Sepals usually 5, the petals (staminodia) sometimes lacking. Fruit fragile. Embryo curved.

Leaves more or less concealed by the imbricate stipules, or also imbricate, tiny; flowers mostly solitary.

Stipules extraordinarily imbricate, concealing all or nearly all the leaves..... *P. membranacea.*

Stipules, except toward the branchlet tips, not densely imbricate, the leaves more or less evident.

Calyx 2.5–3 mm. long, the lobes densely soft-pubescent even to the mucro..... *P. andina.*

Calyx scarcely 2 mm. long, the lobes more or less puberulent or glabrescent..... *P. Mandoniana.*

Leaves markedly longer than the slightly or not at all imbricate stipules; flowers usually glomerulate.

Calyx glabrous, the mucronate apex of the sepals about one-third as long as the herbaceous base..... *P. brasiliana.*

Calyx more or less pubescent, the lobes short-mucronulate.

Leaves exceeding the internodes..... *P. chilensis.*

Leaves shorter than the internodes..... *P. microphylla.*

Paronychia andina Gray, U. S. Expl. Exped. 128. 1854.

Depressed, tufted, the caudex branches much crowded, the stems 5–15 cm. long, nearly glabrous; stipules imbricate, oblong-lanceolate; leaves coriaceous, nearly imbricate, ovate-oblong, awn-pointed, puberulent or glabrate, 2–3 mm. long, scarcely exceeding the stipules; flowers subsessile, terminally congested with the silvery-scarious bracts; calyx softly puberulent, the sepals oblong, scarious, the midrib shortly awn-produced; stamens 5, setaceous, shorter than the sepals.—Growing from 3,000 meters to the limit of vegetation (Gray).

Lima: Viso, sterile, stony summit, *624.* Baños (*Wilkes Exped.*, type). Río Blanco, 4,500 meters, stony slope, *3048.* Casa Cancha to Culnai and Alpamarca (*Wilkes Exped.*). Same region (*McLean*). —Junín: Cerro de Pasco (*Mathews*).—Cuzco: Cerro de Colquipata, 4,100 meters, open, grassy puna, *Pennell 13740.* Hills of Sacsahuamán (*Herrera 21140*); at 3,600 meters, *Herrera 2375.* Bolivia.

Paronychia bonariensis DC. Prodr. 3: 370. 1828. *P. brasiliana* DC. in Lam. Encycl. 5: 23. 1804.

Cespitose, the numerous stems prostrate; leaves elliptic, acute at the base, acuminate, lightly pubescent on both sides, 5–10 mm. long, 1–2 mm. broad; stipules lanceolate, long-acuminate, often lacerate; flowers glomerate in the leaf axils; sepals shorter than 2 mm., glabrous, tipped with a slender, straight awn; petals setiform.—Illustrated, Mart. Fl. Bras. 14, pt. 2: *pl. 57.*

Arequipa: *Meyen.*—Lima: Baños (*Wilkes Exped.;* det. Gray).—Without locality (*Haenke*). Chile; Brazil.

Paronychia chilensis DC. Prodr. 3: 570. 1828.

Diffuse, prostrate or ascending, glabrescent or more or less pubescent; leaves linear or oblong-lanceolate, attenuate to each end, 8–15 mm. long, 1–2 mm. broad; stipules lanceolate, often lacerate; flowers axillary, solitary or few, subsessile, the scarious, long-acuminate bracts about equaling the turbinate calyx, this to 2.5 mm. long, deeply 5-parted, the ovate-oblong lobes rigidly mucronulate.—*P. Hartwegiana* Rohrb. op. cit. 204, of Ecuador, has the calyx pubescent only at the base and ovate leaves shorter than the internodes; in this last character it resembles *P. bogotensis* Triana & Planch. of Colombia and Ecuador, scarcely distinct from *P. chilensis* except that the sepals are not at all scarious. Illustrated, Mart. Fl. Bras. 14, pt. 2: *pl. 57.* Neg. 7952.

Puno: At 4,200–5,400 meters (*Meyen*). Chuquibambilla, 3,900 meters, crevices of limestone rock, *Pennell 13406.*—Arequipa: Tingo, 2,200 meters, open, rocky slopes, *Pennell 13136.*—Huánuco: Huánuco, 2,100 meters, stony slopes, *3243.* Yanashallas, 4,800 meters, loose, stony slopes, *2480.* Huánuco, rocky cliff *2326* (?). —Cuzco: Between Pisac and Paucartambo, 4,100 meters, *Weberbauer 6919.*—Lima: Viso, *758* (?). Chile to Mexico.

Paronychia Mandoniana Rohrb. Linnaea 37: 208. 1872.

Cespitose, suffrutescent, densely short-puberulent; leaves crowded, spreading, narrowly to broadly lanceolate, cuneate at the base, pungently mucronate, densely scabrous, 6–9 mm. long, 1–2 mm. broad; stipules ovate-lanceolate, long-acuminate, rarely bifid, shorter than the leaves; flowers solitary in the upper leaf axils, subsessile; calyx urceolate-turbinate, pale greenish brown, 2 mm. long, somewhat puberulent, deeply 5-parted, the narrowly lanceolate, 3-nerved lobes broadly scarious-margined; petals subulate, half as long as the calyx lobes; ovary punctate, scabrous, the style twice as long, bifid to the middle.—Very much like *Cardionema* in appearance. Neg. 30177.

Lima: Casapalca, 5,000 meters, *852* (or *P. andina* sens. lat.).—Puno: Azángaro, *Lechler 1760.* Bolivia.

Paronychia membranacea Muschl. Bot. Jahrb. 45: 460. 1911.

Densely cespitose, the few-branched stems becoming naked below, 4–5 cm. long; leaves ovate, mucronulate, minutely puberulent,

scarcely 2 mm. long; stipules appressed, broadly oval or suborbicular, longer than the leaves which they completely conceal; flowers solitary in the upper leaf axils, subsessile; calyx oblong-turbinate, 2.5–3 mm. long, densely puberulent, the 3-nerved, mucronulate, oval-oblong lobes whitish except the brownish base; petals yellowish, subulate, half as long as the calyx; ovary smooth, the bifid style short.—The description of the flowers is by Muschler; a cotype in Herb. Delessert appears to be sterile. Neg. 30179.

Cajamarca: Near Ocros, 4,400 meters, *Weberbauer 2784.*—Junín: Near Oroya, in limestone rocks, 4,000 meters (*Weberbauer 2536*).

Paronychia microphylla Phil. Anal. Mus. Nac. Chile Bot. 1891: 26. 1891.

Woody, with the form of a small shrub, ascending from the base, about 15 cm. high, somewhat villous; leaves elliptic, mucronulate, hirsute, only 5 mm. long, exceeded by the stipules; petals very hirsute without, obtuse, mucronulate.

Arequipa: At 2,300 meters (Weberbauer, 129). Arequipa, 2,600 meters, gravelly stream bed, *Pennell 13159;* rocky ledges, *Pennell 13203.* Southern slopes of Mount Chachani, 3,355 meters, *Hinkley 75.* Tiabaya, 2,100 meters, open, rocky slope, *Pennell 13078.*—Junín: Yanahuanca, 3,000 meters, shrubby slope, *1200.* Chile. "Gateadora."

Paronychia polygonoides Muschl. Bot. Jahrb. 45: 459. 1911.

Suffrutescent, densely cespitose, prostrate or ascending, soon glabrous; leaves crowded, spreading, ovate-lanceolate or narrower, gradually narrowed to the base, pungently mucronate, densely scabrous, 6–10 mm. long, 3–4 mm. wide; stipules broadly ovate, long-acuminate, rarely bifid, glabrous, usually much shorter than the leaves; flowers mostly solitary in the upper leaf axils, subsessile; calyx urceolate, turbinate, 3 mm. long, puberulent or above glabrescent, the lanceolate or ovate-lanceolate lobes narrowly scarious-margined, prominently 3-nerved; petals subulate, half as long as the calyx; stamens 5; style twice as long as the ovary; seeds lenticular, lustrous, microscopically reticulate. Neg. 30178.

Cajamarca: Ocros, 3,500–3,700 meters (*Weberbauer 2702,* type).

Paronychia rigida Muschl. Bot. Jahrb. 45: 458. 1911.

Cespitose, procumbent, densely matted, the much branched stems covered below with dead leaf bases, 10–20 cm. long; leaves

narrowly ovate, subtruncate or nearly amplexicaul at the base, gradually narrowed to the conspicuously aristate apex, minutely puberulent, especially toward the apex, becoming glabrate, 3–5 (–8?) mm. long, 1–2 (–3?) mm. wide; stipules lanceolate, long-acuminate; flowers short-pediceled, in few-flowered glomerules; bracts scarious, lanceolate, acute, about equaling the ovate-oblong calyx, this 2 mm. long, glabrous, its divisions narrowly membranous-margined, apically cucullate-mucronate, the spinulose tips nearly one-third as long as the calyx lobes; petals setiform, scabrous; style minute; fruit tuberculate, included, the seeds brown, smooth, narrowly sulcate beneath.—All the Weberbauer specimens are cited by Muschler, without designation of the type. Negs. 29281 (R. & P. specimen), 30180.

Junín: Near Yauli, 4,400 meters (*Weberbauer 291*). Oroya, 3,700–4,300 meters (*Weberbauer 2626, 2627*). Tarma, 3,500 meters (*Weberbauer 2410*); *Ruiz & Pavón* (det. Mattfeld).—Puno: Poto, 4,500 meters (*Weberbauer 984*).

8. CARDIONEMA DC.

Pentacaena Bartl.

Depressed herbs with needle-like leaves and conspicuous, white stipules. Flowers tiny, appressed. Sepals 5, slightly concave, enclosing the thin-walled fruit that opens irregularly. Stamens 3–5. Petals minute, entire or 2-lobed. Embryo straight.

Cardionema ramosissima (Weinm.) Nels. & Macbr. Bot. Gaz. 56: 473. 1913. *Loeflingia ramosissima* Weinm. Bot. Zeit. 3: 608. 1820. *Pentacaena polycnemoides* Bartl. in Presl, Rel. Haenk. 2: 5. *pl. 49*. 1831.

Densely matted, the much branched stems more or less lanate-pubescent above and closely clothed with scarious, appressed stipules and glabrate, subulate, mucronate leaves, these 4–8 mm. long; flowers sessile in the leaf axils; calyx lobes glabrate or pubescent, often very unequal, the 3 longer usually 4–6 mm. long, long-mucronate, the interior shortly so; fertile stamens 3–5; seeds obovoid, smooth.—Several forms have been recognized, perhaps not specifically distinct, including *C. camphorosmoides* (Camb.) Nels. & Macbr. of Brazil, more diffuse, with puberulent, carinate leaves and subequal calyx lobes; *C. andina* (Phil.) Nels. & Macbr. of Chile, a tiny plant with solitary flowers; *C. congesta* (Benth.) Nels. & Macbr., of Ecuador (Neg. 30175), apparently better marked by reason of its

shorter leaves that are spinulose, the cartilaginous tip fully half as long as the herbaceous part of the leaf. Illustrated, DC. Mém. Paronychia *pl. 4;* Mart. Fl. Bras. 14, pt. 2: *pl. 56*, apparently a diffuse form or species.

Huánuco: Chavanillo, 2,400 meters, dry bank, *1976.*—Lima: Río Blanco, 4,500 meters, dry, stony slope, *809.*—Puno: Chuquibambilla, 4,000 meters, rocky, clay soil on puna, *Pennell 13354.* Western North America; Chile, Brazil, Argentina.

9. **DRYMARIA** Willd.

Slender, rather openly branched herbs, rarely simple, with tiny flowers in axillary or terminal cymes. Sepals and petals (staminodia) 5, the latter with 2 or 4 parts. Stamens 5, sometimes by abortion fewer.—Besides the following, *D. arenarioides* Willd., *D. ramosissima* Schlecht., and *D. sperguloides* Gray were reported by Weberbauer, the first from the Titicaca region and Huaraz, the second from above Supe in the Department of Lima, and the third from above Samanco, in Ancash. As the first two are otherwise known only from Mexico and the last from Texas, it is more than probable that the Weberbauer references apply to one or the other of the following species, which, however, may not all be distinct from northern species. *D. molluginea* (Lag.) Didr., as to Peru (Weberbauer, 139, 144, and Bruns, Mitt. Inst. Allg. Bot. Hamburg 8: 48. 1929), is *Spergularia collina* I. M. Johnston.

Petals none; plants coarse.

Calyx 4–5 mm. long.....*D. apetala.*

Calyx 8–10 mm. long.....*D. macrantha.*

Petals present, sometimes shorter than the sepals.

Plants shrubby or perennial and more or less enduring at the base.

Shrub with awl-like, appressed leaves.....*D. frutescens.*

Perennials, more or less woody below, the leaves not awl-like.

Leaves oblong-lanceolate, glabrate or not ovate.

Leaves lance-acuminate.....*D. auriculipetala.*

Leaves oblong-ovate, obtuse, apiculate.....*D. squarrosa.*

Leaves ovate, puberulent.....*D. stereophylla.*

Plants annual or biennial or at least herbaceous to the base.

Flowers large, about 10 mm. long.....*D. grandiflora.*

Flowers much smaller.

Pubescence, at least on pedicels, definitely viscid-glandular; flowers rarely densely fasciculate.

Leaves petioled or subpetioled, the radical evanescent.

Fruiting pedicels divaricate or deflexed, the lower elongate.....*D. divaricata.*

Fruiting pedicels erect or suberect, 2–10 mm. long.

Stems glabrous; seeds bluntly tuberculate. *D. viscidula.*

Stems glandular; seeds acutely tuberculate. *D. agapatensis.*

Leaves of the stem sessile, the radical persisting. *D. praecox.*

Pubescence eglandular or the glandulosity very obscure.

Leaves mostly well petioled, the lower petioles often 6 mm. long.

Leaves, at least some of them, conspicuously if sparsely long-hirsute.....*D. hirsuta.*

Leaves not at all hirsute with long hairs.

Leaves puberulent, 2.5–3.5 cm. long; peduncles villous. *D. ovata.*

Leaves glabrous or glabrate, shorter; peduncles not villous.

Leaves well petioled, even the upper.

Plants many-flowered, the flowers about 3.5 mm. long.....*D. divaricata.*

Plants few-flowered, the flowers 1–3 or few, about 2.5 mm. long.....*D. pauciflora.*

Leaves subsessile or the petioles very short. *D. cordata.*

Leaves sessile or subsessile, even the lower, the basal sometimes petioled.

Sepals more or less rigidly cuspidate-acuminate.

Cymes head-like, the flowers not clearly separated. *D. fasciculata.*

Cymes dense but dichotomous, each flower bracted and separated.....*D. devia.*

Sepals obtuse or acute but not aculeate-acuminate.

Sepals keeled by the strong midnerve..*D. Engleriana.*

Sepals not keeled, the midnerve obsolete or inconspicuous.

Petals and sepals about equal in length or the former shorter.

Inflorescence an open cyme.

Sepals oblongish; petals gradually clawed.

Radical leaf rosettes marcescent; leaves roundish, obtuse or acute.....*D. cordata.*

Radical leaf rosettes persisting; leaves ovate, apiculate.....*D. praecox.*

Sepals roundish; petals abruptly clawed. *D. sphagnophila.*

Inflorescence not an open cyme.

Flowers cymose-fasciculate.....*D. nitida.*

Flowers in short, dense racemes..*D. glaberrima.*

Petals distinctly exceeding the sepals.

Flowers showy; hill plant.....*D. rotundifolia.*

Flowers rather inconspicuous, the petals slightly longer than the sepals; loma plant. *D. Weberbaueri.*

Drymaria agapatensis Baehni & Macbr., sp. nov.

Herba annua suberecta ad 20 cm. alta; ramis paucis fere strictis teretibus, internodiis elongatis e basi fere ad apicem minute glandulosis; stipulis setaceis; foliis late rotundato-reniformibus obtusis vel subacutis valde ad basin angustatis breviter petiolatis vel subsessilibus membranaceis glabris, interdum circa 1.5 cm. longis latisque, nervis tenuibus vix notatis; floribus subglobosis laxe dichotomocymosis; pedicellis plerumque erectis vel suberectis 5–10 mm. longis minute glandulosis; sepalis subelliptico-ovatis anguste scarioso-marginatis nervo medio inferne incrassato glanduloso 4.5 mm. longis, stylo ad medium vel ultra 3-partito; seminibus acute tuberculatis.—This was distributed as *D. divaricata,* but it seems clearly distinct in its short petioles, glandular stems, and suberect pedicels.

Puno: Agapata, *Lechler 1947,* type in Herb. Delessert.

Drymaria apetala Bartl. in Presl, Rel. Haenk. 2: 7. 1831.

Erect, the erect branchlets more or less compressed at the nodes; leaves ovate or ovate-lanceolate or the lowest subcordate, acute, subsessile, 12–16 mm. long, 8–10 mm. broad, the smaller upper ones

acuminate; flowers many, in terminal, fastigiate corymbs; sepals 4–5 mm. long, oblong, acutish, slightly and minutely puberulent like the always erect, somewhat longer pedicels; capsule included, oblong; seeds about 20, blackish.

Ancash: Ocros, 2,700 meters, *Weberbauer 5814*.—Ayacucho, 3,300 meters, *Weberbauer 5827*.—Lima: Canta, *Ruiz & Pavón* (det. Mattfeld). Obrajillo, cliff ledges, *Pennell 14321* (det. Mattfeld). Chile.

Drymaria auriculipetala Mattfeld, sp. nov. in herb.

Suffrutex vel ramis juvenilibus herbaceis, ramis simplicibus gracilibus numerosis ad 60 cm. longis sat angulatis valde nodulosis demum teretibus, glabris vel superne minutissime sparseque pulverulentis; stipulis rigido-setaceis 1.5 mm. longis tarde caducis; foliis coriaceis glabris vel glabratis anguste ovato-lanceolatis acuminatis sessilibus ad 10 mm. longis, 2 mm. latis, subtrinerviis plus minusve cartilagineo-marginatis, nervis supra vix notatis subtus prominentibus praesertim costa media; floribus solitariis vel in cymis paucifloris, pedunculis interdum dichotomis; pedicellis 1–2 mm. longis; sepalis oblongo-lanceolatis cuspidato-acutis, basi conspicue incrassatis, 8 mm. longis; petalis basi auriculatis apice bifidis, 7 mm. longis; seminibus complanatis fere orbiculatis tuberculatis.

Huánuco: Pendent from cliff ledges, 2,500 meters, Llata, *Macbride 2264*, type in Herb. Field Mus.

Drymaria cordata (L.) Willd. ex R. & S. Syst. 5: 406. 1819. *Holosteum cordatum* L. Sp. Pl. 88. 1753.

Plants tiny and simple or nearly so or larger and loosely much branched, glabrous or slightly pubescent above; leaves nearly orbicular or broader than long, usually exceeded by the often forked peduncles; pedicels and calyces subequal, the petals shorter than the acute sepals, these 1.5–3 mm. long.—Sometimes rather weed-like in moist, disturbed ground and, distributed nearly everywhere in tropical America, no doubt in Peru, where probably masquerading under one or more of the specific names here included; see Rohrbach in Mart. Fl. Bras. 14, pt. 2: 259, where illustrated, *pl. 60*.

Lima: Matucana, *189*.—Huánuco: Mito, in clearing, *1714*. Muña, *3918*. Tropical America.

Drymaria devia Baehni & Macbr., sp. nov.

Planta annua minima plus minusve diffusa fere glabra, caulibus 1–3 (–6) cm. longis simplicibus vel paullo ramosis; foliis sessilibus coriaceo-rigidis ovatis acutis vel apiculatis 3–5 mm. longis, 2–3.5 mm.

latis, nervis obscuris; floribus subsessilibus binato-scarioso-bracteatis plerumque 3 in fasciculam plus minusve congestis; bracteis 2.5 mm. longis acuminatis; sepalis oblongo-lanceolatis aculeato-acuminatis margine scariosis dorso glanduloso-puberulis, 4 mm. longis; petalis ad medium bifidis, lobis lineari-oblongis, 3 mm. longis; seminibus irregulariter tuberculatis.—Differs from *D. fasciculata* in size and habit and placement of the bibracteate flowers, these, though fascicled, being borne one below the other. We associate doubtfully here the plant from Puno. Our species is probably *D. leptoclados* Hemsl. var. *peruviana* Ball, Journ. Linn. Soc. 22: 32. 1885, but as we have not seen Ball's specimen, we do not take up his name. The Peruvian species differs markedly from Hemsley's, of Mexico, in habit, size, fewer flowers, petals less divided, and capsule much shorter than calyx.

Lima: Open, rocky slopes near Canta, 4,000 meters, *Pennell 14655*, type in Herb. Field Museum.—Puno: Rocky knoll in siliceous slope, 4,000 meters, Araranca, *Pennell 13462*(?).

Drymaria divaricata HBK. Nov. Gen. & Sp. 6: 24. 1823.

Stems glabrous, weak, filiform, branched, 20 cm. long or longer; leaves glabrous, broadly rounded-ovate, rounded at the base but decurrent to the petiole, this 6–8 mm. long, acute, 14–18 mm. long; peduncles irregularly branched, divaricate, many-flowered, filiform, glabrate, with lanceolate, persistent, opposite bracts; pedicels filiform, viscid-pubescent, in fruit 16–18 mm. long, divergent and deflexed; petals not clawed, deeply bifid, a little longer than the glabrous sepals, these oblong, acute, 3-nerved; capsule ovate, shorter than the calyx, about 5-seeded, the seeds brown-tuberculate.

Lima: (*Humboldt*). Amancaes, *Ruiz & Pavón* (det. Mattfeld, ex descr.).

Drymaria Engleriana (Muschler) Baehni & Macbr., comb. nov. *Polycarpon Englerianum* Muschler, Bot. Jahrb. 45: 452. 1911.

Planta annua prostrata basi ramosissima, ramis subsimplicibus gracilibus paullo flexuosis 5–10 cm. longis; stipulis setaceis; foliis sessilibus late ovatis acutis membranaceis leviter pilosis, nervis subtus vix notatis, plerumque 4 mm. longis 2.5–3 mm. latis, superioribus gradatim reductis; floribus subsessilibus 2–4 in fasciculam dispositis; bracteis scariosis circa 3 mm. longis; sepalis oblongo-ovatis acutis valde carinatis, costa media prominente, 3 mm. longis; petalis profunde, usque ad medium, bifidis inferne abrupte constrictis 2–2.5 mm. longis; seminibus puncticulatis.

Lima: Prostrate on stony slopes, Viso, *Macbride 566.*—Ancash: Huaraz, 4,300 meters, *Weberbauer 310*, type.

Drymaria fasciculata Gray, U. S. Expl. Exped. 125. 1854. *D. leptoclados* Hemsl. var. *peruviana* Ball, Journ. Proc. Linn. Soc. 22: 32. 1885(?).

A nearly glabrous, erect, simple or little branched annual; leaves only 3 or 4 pairs, sessile, ovate-oblong, acute, 1–2 cm. long, obscurely 3-nerved; peduncle erect and strict, to 10 cm. long, minutely glandular toward the apex; flowers subsessile, crowded in a dense fascicle, subtended by oblong-ovate, cuspidate, scarious bracts little shorter than the calyx; sepals oblong-lanceolate, cuspidate-acuminate, 6 mm. long, scarious-margined and conspicuously 3-nerved, subequaling the 5 oblong-linear, 2-lobed petals; capsule shorter than the calyx; seeds scabrous.—*D. stellarioides* Willd. ex. R. & S. Syst. 5: 406. 1819, of Ecuador, has oblong-lanceolate leaves only 2 mm. wide but, apparently, would key here.

Lima: Matucana, moist, rocky slope, *187* (det. Mattfeld). Río Blanco, open, stony slope, *693* (det. Mattfeld). Obrajillo (*Wilkes Exped.*). Chicla (*Ball*, probably).

Drymaria frutescens Mattfeld, sp. nov. in herb.

Fruticosa ubique glabra ut videtur suberecta vel plus minusve diffusa circa 30 cm. alta, ramis flexuosis adscendentibus subtetragonis pauce ramosis fere nudatis griseo-brunneis, ramulis terminalibus congestis 6–10 cm. longis dense foliatis; foliis adpresso-imbricatis sessilibus rigidis conspicue trinerviis subulato-acuminatis vix 4 mm. longis; floribus subsessilibus solitariis fere 6 mm. longis; sepalis oblongo-lanceolatis apiculato-acuminatis 7 mm. longis; petalis bifidis basi cuneatis 4–5 mm. longis; seminibus ut videtur papillosis.

Peru: Without locality, 1909–1914, *Weberbauer 7203*, type in Herb. Field Museum.

Drymaria glaberrima Bartl. in Presl, Rel. Haenk. 2: 7. 1831.

Glabrous, much branched from the base, 20–25 cm. high; leaves subsessile, narrowed to the base, acutish, cuspidate or the upper acuminate, more or less 3-nerved, broadly ovate; stipules minute, promptly caducous; flowers in short, few-flowered racemes, the common axillary peduncle greatly elongate; pedicels all shorter than the calyx, always erect, 3–4 in each corymb; bracts lanceolate, scarious; calyx 4 mm. long, the oblong, acute divisions white-translucent, slightly longer than the semi-bifid petals; stamens 5, much shorter than the calyx, this nearly twice exceeding the capsule.

Huánuco: Huánuco, stony slopes, *3506*. Montaña (*Haenke*).—Lima: Moist places, Huamantanga (*Mathews*, det. Planchon).

Drymaria grandiflora Bartl. in Presl, Rel. Haenk. 2: 7. 1831.

Basal branches sometimes nearly 30 cm. high, remotely branched, finely pubescent toward the tip; leaves very remote, broadly ovate, subsessile, rounded or subcordate at the base, acuminate, mucronate, 5-nerved, sparsely pubescent or glabrate, to nearly 2 cm. broad, the upper much smaller; stipules scarious, nearly lanceolate, acuminate, caducous; flowers in axillary and terminal, dichotomous corymbs, 5–7, the terminal corymbs long-peduncled; pedicels always erect, many times longer than the calyx, this 6 mm. long, minutely pubescent, the oblong, acutish sepals scarious-margined; petals 5, 2-parted to the base, the divisions linear, slightly exceeding the calyx, this a little longer than the capsule.

Huánuco: Montaña (*Haenke*, type).—Lima: Huaros, bushy, rocky slopes, *Pennell 14724* (det. Mattfeld).

Drymaria hirsuta Bartl. in Presl, Rel. Haenk. 2: 8. 1831.

Many-stemmed, spreading, hirsutulous nearly throughout, the diffuse, procumbent branches to 15 cm. long; leaves reniform, rounded at the apex or rarely minutely cuspidate, broadly cordate at the base, the lowest shortly narrowed to the (6–8 mm. long) petiole, obsoletely nerved, 10–12 mm. broad, the much smaller upper ones subsessile; stipules obsolete, hair-like; flowers few, the filiform, glabrous common peduncle equaling the internodes; pedicels finally twice as long as the calyx, deflexed in fruit; calyx 2 mm. long, the ovate-oblong sepals obtusish; petals deeply bifid, very narrow; stamens 3–4; capsule a little longer than the calyx. Neg. 27717.

Huánuco: Mito, *3266*, *1543*. Montaña (*Haenke*).—Puno: Sandía, *Weberbauer 581*.—Ayacucho: Carrapa, *Killip & Smith 23212*. Bolivia.

Drymaria macrantha Gray, U. S. Expl. Exped. 126. 1854.

Many-stemmed, laxly branched, slightly puberulent, especially above; leaves sessile, cordate-ovate, acute, 3–5-nerved, 10–14 mm. long; peduncle 2.5 cm. long or less; cymes rather close but even the lateral pedicels 6–12 mm. long; bracts narrowly subulate, greenish, with narrow, scarious margins below, 4–6 mm. long; sepals ovate-oblong, 8–10 mm. long, slightly 3-nerved, minutely glandular except the broad, hyaline margins; petals none; stamens 5; capsule shorter

than the calyx; seeds scabrous.—This is referred by Mattfeld (in herb.) to *D. apetala.*

Lima: Obrajillo (*Wilkes Exped.*, type).

Drymaria nitida Ball, Journ. Proc. Linn. Soc. 22: 31. 1887.

A small, glabrous annual, branching from the base; branches suberect, 8–20 cm. high; leaves broadly elliptic-ovate, acute or cuspidate, sessile; stipules minute, setaceous, fugacious; cymes terminal, dense, the flowers short-pediceled; bracts scarious, ovate; sepals broadly ovate, obtusish, purplish on the margin; petals narrowed to a claw, deeply parted; capsule subglobose, 8-seeded.—Near *D. divaricata* HBK., but that has larger, laxer inflorescences, acute sepals, and less deeply parted petals (Ball).

Lima: Chicla (*Ball*, type). Matucana, *188.*—Junín: Tarma, *Killip & Smith 21810.*

Drymaria ovata Willd. ex R. & S. Syst. 5: 406. 1819.

Stems weak, procumbent, the branches puberulent or villous toward the tips; petioles 6 mm. long, villous; leaf blades ovate, acute, puberulent on both sides, 2.5–3.5 cm. long, 2–2.5 cm. wide; stipules persistent; peduncles bifid, few-flowered, the pubescent pedicels reflexed in fruit, 6–8 mm. long; calyx glabrous, the sepals oblong, acute, equaled by the deeply bifid petals.—The determination of the following material from southern Peru is probably open to question, in view of the fact that the species appears to be unknown otherwise except from northern Peru and Ecuador.

Arequipa: Pasco; Mejía (*Günther & Buchtien 295, 296, 297*, det. Bruns).—Lima: Above Supe, 3,000 meters (*Weberbauer 169*).—Without locality: *Weberbauer 5327a, 6543.* Ecuador to Venezuela.

Drymaria pauciflora Bartl. in Presl, Rel. Haenk. 2: 8. 1831.

Slender, sparsely branched, procumbent or diffuse, less than 30 cm. high; leaves remote, cordate-suborbicular, sometimes nearly truncate at the base, often subsinuately margined, sparsely pubescent, lightly 3–5-nerved, 6–12 mm. broad; petiole slender, usually shorter than the leaf blade; stipules hyaline; flowers few, less than 2 mm. long; peduncles binate or ternate, 1–2-flowered, glabrous, reflexed in fruit, with 2 tiny bracts at the middle; sepals glabrous, scarcely 2 mm. long, obtusish, nearly twice exceeded by the ovate capsule; petals 5, deeply bifid; stamens 2–3.

Huánuco: Montaña (*Haenke*, type).—Huánuco: Cushi, rocky, partly sunny slopes, *4835* (det. Mattfeld).—San Martín: San Roque, *Williams 7621.*

Drymaria praecox Baehni & Macbr., sp. nov.

Herba annua stricta 3–5 cm. alta, caulibus solitariis vel interdum 3–4 glabris; foliis radicalibus persistentibus dense rosulatis brevissime petiolatis obovato-spathulatis minute parceque hirsutulis 3–6 mm. longis; stipulis subulato-setaceis; foliis superioribus plerumque solum 2 sessilibus ovatis apiculato-acutis glabris 4 mm. longis, 3 mm. latis; floribus circa 5 in cymulas sat laxas terminales dispositis; pedicellis minutissime glanduloso-puberulis erectis 2–4 mm. longis; sepalis oblongo-lanceolatis 3 mm. longis 3-nerviis extus obscure puberulis; petalis profunde, ultra medium, partitis, 3 mm. longis; stylo ad medium 3-partito.—Scarcely a diminutive form of *D. cordata*, in view of the persistent rosettes of root leaves and the uniformly strict habit; probably a loma or desert plant.

Peru: Without locality, *Weberbauer 6916*, type in Herb. Field Museum.

Drymaria rotundifolia Gray, U. S. Expl. Exped. 123. 1854.

Glabrous, erect and slender, 10 cm. or sometimes several dm. tall; leaves roundish, sessile, the larger about 6 mm. long; cymes corymbose, many-flowered, on peduncles 1–3 cm. long; pedicels slender, erect even in fruit, sometimes minutely glandular, the outer 2–4 mm. long; bracts minute, entirely scarious; calyx 3 mm. long; sepals oval, very obtuse, faintly 3-nerved, narrowly scarious-margined; petals about a third longer than the calyx, narrowly cuneiform, cleft to the middle; capsule ovoid, a little longer than the calyx; seeds muricate-tuberculate.

Lima: Open, rocky slopes, San Buenaventura, *Pennell 14516*. Above Obrajillo, *Pennell 14390*. Obrajillo (*Wilkes Exped.*, type). Open hillside, *Killip & Smith 21761*. Matucana, disintegrated granite, *261;* wet, rocky slope, *183*.

Drymaria sphagnophila Baehni & Macbr., sp. nov.

Planta flaccida diffusa plus minusve pilosa, caulibus ut videtur subprostratis remote ramosis sat foliosis glabris 5–10 cm. longis; stipulis capillaceo-setaceis minutis; foliis sessilibus subtus plus minusve pilosis, pilis caducis, fere rotundatis 4–6 mm. longis latisque haud vel vix ad apicem angustatis floribus circa 4 racemoso-cymosis; pedunculis glabris filiformibus circa 1 cm. longis; pedicellis circa 2 mm. longis; floribus fere globosis; sepalis rotundato-ellipticis obtusis 2 mm. longis; petalis ultra medium bifidis; lobis acutis, 2–2.5 mm. longis, basi abrupte constrictis longe unguiculatis; seminibus tuberculatis lenticularibus.

Huánuco: Sunny sphagnum bog, 3,000 meters, Mito, *Macbride 1542*, type in Herb. Field Museum.

Drymaria stereophylla Mattfeld, sp. nov. in herb.

D. auriculipetalae similis; planta interdum plus minusve caespitosa et ubique plus minusve minute pulverulenta vel granulato-glandulosa; stipulis interdum obsoletis; foliis ovatis apiculatis 6–8 mm. longis, 3–5 mm. latis, nervis costa media excepta utrinque vix notatis vel subtus paullo prominentibus; sepalis valde scarioso-marginatis oblongo-ellipticis cuspidatis, 6–7 mm. longis; petalis basi subauriculatis, apice bifidis, 8 mm. longis; seminibus fere laevibus.

Junín: In crevices of limestone cliffs, 4,000 meters, La Oroya, *Macbride 962*, type in Herb. Field Mus. Rocky hillside, Huancayo, 3,300 meters, *Killip & Smith 22134, 22132; Weberbauer 6600.* —Huánuco: In mats on shaded canyon ledges, Chasqui, *1761.*— Lima: In clumps, loose, steep canyon sides, Viso, *563.*

Drymaria viscidula Gray, U. S. Expl. Exped. 124. 1854.

Stems diffuse, to 30 cm. long, glabrous except at the tip; branchlets and inflorescence glandular-pubescent; leaves subreniform-ovate, 6–8 mm. long, 8–10 mm. broad, abruptly contracted to a somewhat hairy petiole; stipules capillary-setaceous; peduncles to 2.5 cm. long, glandular-glutinous; cyme 5–15-flowered, the bracts setaceous-subulate; lateral pedicels 2–4 mm. long, erect even in fruit; calyx 3 mm. long, the oblong, acute sepals about equaling the narrowly cuneate, 2-cleft petals and capsule; seeds obscurely tuberculate.

Lima: Obrajillo (*Wilkes Exped.*, type). Open, rocky slopes, San Buenaventura, *Pennell 14518.*

Drymaria Weberbaueri Muschl. Bot. Jahrb. 45: 451. 1911.

Branching at the base and sparsely above, about 15 cm. high, glabrous or most obscurely pruinose-glandular; leaves ovate-orbicular, slightly cordate or truncate at the sessile base; peduncles 1–several cm. long, bearing 1–3 head-like fascicles of several more or less spreading or nodding flowers, the pedicels 2–3 mm. long; sepals acutish, 4 mm. long, the somewhat longer petals more or less conspicuous.—All the determinations are by Mattfeld.

Lima: Barranca in the loma (*Weberbauer 1662, 1657*, types). Loose, stony, upper slopes of seaside hills, Chorrillos, *5863.* Rocky hillside, San Gerónimo, *5904.* Sandy lomas along the sea, Lurín, *5963.* Open, sandy slopes, Atocongo, *Pennell 14783.*

10. POLYCARPON L.

Small herbs with scarious stipules and bracts, the tiny flowers in crowded, terminal or partly axillary cymes. Petals minute. Stamens 3–5. Styles short.—Loefling wrote the name *Polycarpa.*

Polycarpon apurense HBK. Nov. Gen. & Sp. 6: 33 (40). 1823.

Stems many, more or less matted and branched or diffuse; leaves verticillate, the upper opposite, linear-spatulate, obtusish, narrowed to the base, ciliate, 12 mm. long, half as long as the internodes; stipules ovate, acuminate, pubescent; cymes dichotomous, axillary and terminal; flowers pedicellate, the bractlets similar to the stipules; calyx glabrous, persistent, the lanceolate, obtuse lobes longer than the petals; styles 3; capsule oblong, acute; seeds many, oblong, brown, scabrous.—Description from HBK. Included by Rohrbach in *P. depressum* (L.) Rohrb., an untenable name, as pointed out by Harms, Pflanzenfam. ed. 2. 16c: 308, because of *P. depressum* Nutt. of California (and the Andes?), a glabrous plant; the synonomy is involved. The nearly cosmopolitan *P. tetraphyllum* L. is quite glabrous, with a leafless inflorescence, has obovate leaves only 5–10 mm. long and oblong, carinate sepals 2 mm. long.

Peru: (Probably). South America (Pax & Hoffmann).

Polycarpon Englerianum Muschl. Bot. Jahrb. 45: 452. 1911.

A densely cespitose annual or biennial with numerous spreading-ascending, much branched stems 2–4 cm. long; leaves obovate or obovate-lanceolate, obtuse or acutish, gradually narrowed to a short petiole, more or less densely crisp-pubescent, 5–6 mm. long, 3–3.5 mm. broad; stipules scarious, triangular-lanceolate, 1 mm. long, minutely and sparsely puberulent; flowers in dense clusters, mostly subsessile; bracts scarious, ovate, acuminate; calyx lobes oblong, obtusish, prominently carinate, membranous-margined, more or less densely puberulent, the outer 2 mm., the inner 3 mm. long; petals 5 or fewer or none, lanceolate, sometimes emarginate, about half as long as the calyx; stamens 3 or rarely 5; capsule about as long as the calyx, the minute seeds reddish.—Probably only a densely cespitose form of *P. apurense.* Neg. 27705.

Ancash: Huaraz, 4,300 meters (*Weberbauer 3101*, type).

Polycarpon Urbanianum Muschl. Bot. Jahrb. 45: 452. 1911.

A densely cespitose, much branched annual, the stems 2–4 cm. long; leaves ovate or ovate-lanceolate, usually acute, narrowed to a rather long petiole, more or less densely puberulent, 6–8 mm. long,

4–5 mm. broad; stipules 1 mm. long; pedicels, if present, short and densely puberulent; outer calyx lobes 1 mm., the inner nearly 2 mm. long; otherwise like *P. Englerianum*, but much less branched.

Ancash: Huaraz, 4,300 meters (*Weberbauer 2985*, type).

11. POLYCARPAEA Lam.

Erect herbs with mostly rosulate leaves and more or less crowded, silvery, bracted inflorescences of tiny flowers. Stamens 5, united in a ring with the petals or staminodia. Styles elongate.—*Microphyes* Phil. may occur on the coast of southern Peru; it is a tiny, branched herb, distinguished by styles not longer than the ovary.

Polycarpaea corymbosa (L.) Lam. Ill. 2: 129. 1791. *Achyranthes corymbosa* L. Sp. Pl. 205. 1753. *P. filifolia* Muschl. Bot. Jahrb. 45: 453. 1911.

A slender annual with mostly rosulate, filiform leaves, the stem closely branched at the summit and bearing a lustrous, scarious-bracted cyme; calyx lobes scarious, white, 2.5–3.5 mm. long, the petals yellowish in age, the capsule scarcely half as long; seeds 5–6, lightly grooved on the back.

San Martín: Moyobamba, 1,000 meters, *Weberbauer 4587*, type of *P. filifolia*. South America.

12. SPERGULARIA (Pers.) J. & C. Presl

Reference: Rohrbach, Linnaea 37: 219–244. 1872.

Annual, perennial, or sometimes even suffrutescent plants with narrow, opposite leaves and more or less prominent stipules, the flowers in cymes or short racemes. Sepals characteristically thin at the edges. Styles commonly 3.—*Spergula arvensis* L. may occur as an introduction from Europe; it usually has 5 styles, flowers borne in terminal, cymose panicles, and crowded, apparently whorled leaves. *S. squarrosa* Muschl. is scarcely a *Spergularia* and is omitted from the key; see note after the description. Persoon established the name as a section of *Arenaria*; a few authors have united the group with *Spergula* L., and there is no reason except the convenience of tradition against their action. The name has been conserved in place of *Tissa* Adans.

Seeds winged or rarely a few wingless; stamens mostly 10.

Seeds tuberculate; stipules connate for one-third their length.
S. villosa.

Seeds smooth.

Stipules connate only at the base.....*S. grandis.*

Stipules connate about half their length.....*S. media.*

Seeds mostly wingless; stamens 5 or fewer.

Plants annual or short-lived perennials.....*S. salina.*

Plants perennial.....*S. macrotheca.*

Seeds all wingless.

Plants diminutive, the stems only 2–5 cm. long; perennial. *S. andina.*

Plants usually about 10 cm. tall.

Leaves imbricate; stipules finely lacerate.....*S. congestifolia.*

Leaves, at least the lower, not imbricate; stipules if lacerate, only at the tip, or rarely fimbriate half their length.

Stems more or less glandular-villous or glandular-puberulent.

Glandular-puberulent perennials or biennials.

Calyx 6–7 mm. long; branches ascending.

Lowest internodes much exceeding the leaves; stipules lacerate above.....*S. Stuebelii.*

Lowest, like the upper, internodes slightly shorter than the leaves; stipules all fimbriate one-half their length.....*S. laciniata.*

Calyx 3–4.5 mm. long; branches usually prostrate. *S. campestris.*

Glandular-villous annual, erect with ascending branches. *S. collina.*

Stems glabrate, with sessile or short-stipitate glands. *S. stenocarpa.*

Spergularia andina Rohrb. Linnaea 37: 234. 1872.

Stems prostrate or ascending, 2–5 cm. long, densely crisp-pubescent; leaves short-mucronulate, glabrescent, 10–15 mm. long, 0.5 mm. broad; stipules ovate-lanceolate, long-acuminate, 3–4 times longer than broad, 5–6.5 mm. long, connate below; flowers few, terminal and solitary; pedicels densely white-hirsute; sepals ovate-lanceolate, obtusish, broadly scarious-margined, often reddish, more or less hirsute, 4–5 mm. long, scarcely exceeding the broadly ovate, obtuse, suberose petals; capsule scarcely exserted. Neg. 27713.

Puno: Azángaro, *Lechler 1772.* Bolivia.

Spergularia campestris (L.) Aschers. Fl. Mark. Brandenb. 194. 1864. *Arenaria rubra* var. *campestris* L. Sp. Pl. 423. 1753.

Biennial or sometimes a short-lived perennial, the stems nearly always prostrate, to 15 cm. long, glabrescent below, glandular-puberulent above; leaves linear-filiform, mucronate, glabrate, 1–2 cm. long; stipules ovate-lanceolate, attenuate, acuminate, 2 or 3 times longer than broad, short-connate; inflorescences scorpioid in fruit, racemose, the pedicels mostly shorter than the calyces or sometimes apparently much exceeding them; sepals 3.5–4.5 mm. long, nearly equaled by the petals and capsule; seeds brown, tuberculate. —The correctness of the name is not certain.

Peru: (Probably). Cosmopolitan.

Spergularia collina I. M. Johnston, Contr. Gray Herb. 81: 89. 1928.

A loosely and dichotomously branched annual, 5–10 cm. high, abundantly but shortly glandular-villous; leaves spreading, linear, 1–2 cm. long; stipules ovate, acuminate, often more or less lacerate, connate basally, 1 mm. long; flowers axillary, on slender, spreading or reflexed pedicels as long as or longer than the leaves; sepals nearly oblong, 4–5 mm. long, the white petals slightly shorter; stamens 10; capsule ovoid, included; seeds black, opaque, all wingless, compressed, tuberculate or glandular-mucronulate.—Illustrated, Weberbauer, 144 as *Drymaria molluginea.*

Arequipa: Sandy, open places behind Mollendo, *Johnston 3568* (type).

Spergularia congestifolia I. M. Johnston, Contr. Gray Herb. 81: 90. 1928.

Perennial, with many branching, prostrate stems 2–8 cm. long; peduncles ascending, glandular-villous, 3–8 cm. long; leaves strongly congested, linear-setaceous, mucronulate, falcate, hispidulous, somewhat glandular, 3–9 mm. long, longer than the internodes; stipules black, about equaling the leaves, deeply and finely laciniate, basally connate; flowers 3–12, laxly cymose; pedicels 5–12 mm. long; sepals lance-oblong, shortly glandular-villous, 4–6 mm. long, scarious-margined; petals white, slightly longer than the sepals; stamens 10; capsule about 5 mm. long, somewhat exceeding the calyx.

Arequipa: Prostrate on open places in the fertile belt behind Mollendo, *Johnston 3567* (type). Mollendo, *Weberbauer 1503.*

Spergularia grandis (Pers.) Camb. in St. Hil. Fl. Bras. 2: 177. 1829; 236. *Spergula grandis* Pers. Syn. 1: 522. 1805. *Spergularia macrocarpa* Presl, Rel. Haenk. 2: 9. 1831.

Stems many from a thick, woody rhizome, erect, simple or sparsely branched, to several dm. high, glandular-puberulent above; leaves narrowly linear, acute, 2.5–4.5 cm. long; stipules long-acuminate, scarcely connate, 4–5 mm. long; pedicels slender, many times longer than the calyx, reflexed in fruit; sepals shortly glandular-pubescent, 5–6 mm. long, half as broad, about equaled by the purplish-tipped petals; styles 3–5; capsule ovate-oblong, sometimes well exserted; seeds reddish brown, broadly winged.

Huánuco: Montaña (*Haenke*).—Without locality, *Ruiz & Pavón* (det. Mattfeld). Southern South America. "Romerillo."

Spergularia laciniata Baehni & Macbr., sp. nov.

Ut videtur perennis, caulibus prostratis vel plus minusve adscendentibus mediocriter ramosis plerumque 10–15 cm. longis e basi ad apicem satis dense cum pilis minutis patentibus pubescentibus haud vel solum superne paullo glandulosis; foliis undique quam internodiis plerumque paullo longioribus patentibus glabris linearibus acuto-apiculatis 10–15 mm. longis, interdum 1.5 mm. latis; stipulis 6–10 mm. longis ad medium connatis superne multo-fimbriatis; floribus circa 6 in cymam laxam dispositis; pedicellis 6–10 mm. longis minute glanduloso-pilosis; sepalis oblongis scarioso-marginatis glandulosis circa 6 (–7.5) mm. longis; staminibus 10; petalis albis circa 7.5 mm. longis integris; seminibus ignotis.—Differs from *S. Stuebelii* as indicated in the key, also in the exserted petals; from *S. congestifolia*, its not at all imbricate leaves and less deeply laciniate stipules distinguish it readily.

Ica: Loma near the sea, 500 meters, Bahía de la Independencia, *Weberbauer 7958*, type in Herb. Field Museum.

Spergularia macrotheca (Hornem.) Heynh. Nom. Bot. 689. 1840. *Arenaria macrotheca* Hornem. ex Cham. & Schlecht. Linnaea 1: 53. 1826.

A sturdy, half erect perennial, sometimes apparently flowering as a biennial, viscid-pubescent throughout; leaves 1.5–3.5 cm. long; stipules to 6 mm. long; flowers becoming racemose, white or pink, on pedicels 5–15 mm. long; sepals 5–8 mm. long; stamens 5; seeds wingless except those at the base of the capsule, this sometimes slightly exserted.

Peru: (Probably). Widely distributed; Chile.

Spergularia media (L.) Griseb. Spic. Fl. Rumel. 1: 213. 1843. *Arenaria media* L. Sp. Pl. ed. 2. 606. 1762.

Perennial, more or less glandular-pubescent, especially above; stems prostrate or ascending, rather strongly nodose, sometimes several dm. long; leaves linear-filiform or subulate, rarely mucronulate, 1–3 mm. long; flowers few to many, the slender pedicels often elongate and spreading or reflexed; calyx 4–4.5 or exceptionally 6 mm. long, equaled by the white, purple-tipped petals; capsule included or distinctly exserted; seeds smooth.—This plant is called *S. marginata* (DC.) Kittel in Taschenb. Fl. Deutschl. ed. 2. 1003. 1844 by Pax and Hoffmann, perhaps rightly, the name *media* being abandoned as "a source of confusion" by some authors, since it is *Arenaria media* L. Sp. Pl. ed. 2. 606. 1762 only in part.

Ancash: Ocros, 3,000 meters, *Weberbauer 2751*(?). Nearly cosmopolitan.

Spergularia salina J. & C. Presl, Fl. Cech. 95. 1819.

In general similar to *S. macrotheca*, but an annual or a short-lived perennial; leaves 1–5 cm. long; pedicels often little longer than the calyx, this 3–4 mm. long; petals reddish, about as long as the sepals, the capsule slightly to well exserted.—*S. marina* (L.) Griseb. Spic. Fl. Rumel. 1: 213. 1843, is apparently the same, based on *Arenaria rubra* var. *marina* L. Sp. Pl. 423. 1753; *S. marina* Pallas, Reise 3: 603. 1776.

Peru: (Probably). Widely distributed.

Spergularia stenocarpa (Phil.) I. M. Johnston, Contr. Gray Herb. 85: 41. 1929. *Arenaria stenocarpa* Phil. Fl. Atac. 10. 1860; Viaje Des. Atac. 19, 184. 1860.

Flowering as an annual but sometimes more enduring; leaves narrowly linear, mucronulate, to 16 mm. long; stipules long-acuminate, 5 mm. long; flowers numerous, in dichotomous cymes, the oblong-lanceolate sepals exceeding the white petals; capsule cylindric, 5 mm. long, exserted; seeds black, lustrous.—Johnston reports it as usually an annual but sometimes fruticulose, the yellowish green stems glabrate except for small, sessile or short-stipitate glands. The Peruvian collections were determined by Bruns.

Arequipa: Cachendo, 1,000 meters (*Günther & Buchtien 291, 293a*). Mollendo, 50 meters, *Günther & Buchtien 291b, 292*. Mejía, 40 meters (*Günther & Buchtien 293*). Chile.

Spergularia squarrosa Muschl. Bot. Jahrb. 45: 461. 1911.

Stems many, much branched, especially at the base, erect, 30–50 cm. high, strongly enlarged at the reddish nodes, becoming glabrous; leaves usually much shorter than the internodes, ovate-lanceolate or the upper linear, mucronulate-aristate, glabrescent or rarely densely puberulent, 1.5–2 cm. long, 5–10 mm. wide or the uppermost half as large; stipules minute, lanceolate, connate one-third their length, long-acuminate and often multilaciniate, 5–6 mm. long; flowers many, terminal, nearly capitate, on pubescent pedicels; sepals lance-oblong, obtusish, broadly scarious-margined, densely hirsutulous, 3.5–4 mm. long; petals ovate-oblong, obtusish, a little shorter than the calyx; capsule short-stipitate, sometimes slightly exserted; seeds brown, rotund-obovate, tuberculate.—This is probably a species of *Drymaria* if, indeed, it is not *D. glaberimma* Bartl.; specimen seen, sterile. Neg. 30174.

Lima: Near Matucana, in rocks, 2,570 meters (*Weberbauer 57*, type).

Spergularia Stuebelii (Hieron.) I. M. Johnston, Contr. Gray Herb. 81: 90. 1918. *Tissa Stuebelii* Hieron. Bot. Jahrb. 21: 308. 1895.

Stems numerous, erect, probably to 20 cm. high, below glabrate, above shortly glandular-puberulent throughout; leaves to 1 cm. long, scarcely 0.5 mm. broad, mucronate; lower internodes much longer than the leaves; stipules ovate, basally connate, acuminate, about 5 mm. long, finally mostly lacerate at the tip; flowers few, pedicellate; calyx lobes narrowly lanceolate, broadly hyaline-margined, glandular, 6–7 mm. long, about 1.5 mm. wide; petals white, ovate, acute, 5 mm. long, the capsule slightly shorter; seeds minutely papillose-puberulent.

Arequipa: Base of Mt. Misti (*Stuebel 79*). Arequipa, 2,500–2,900 meters, gravelly stream beds and open, rocky slopes, *Pennell 13247, 13156*. Southern slopes of Mt. Chachani, 3,050 meters, *Hinkley 10*. "Estrellita del cerro."

Spergularia villosa (Pers.) Camb. in St. Hil. Fl. Bras. 2: 178. 1829; 237. *Spergula villosa* Pers. Syn. 1: 522. 1805.

Similar to *S. grandis*, but often more glandular-pubescent; stipules connate one-fourth to one-third their length, usually entire, 5–8 mm. long; pedicels erect or spreading; capsule slightly exserted; seeds yellow, the wing sometimes lacerate, tuberculate.—*S. laevis* Camb., allied but the petals 3–4 times shorter than the glabrous calyx, may be expected. Illustrated, Mart. Fl. Bras. 14, pt. 2: *pl. 61*.

Peru: (Probably). Southern South America.

13. SILENE L.

Melandrium Roehl.

Reference: Rohrb. Linnaea 36: 196–258. 1869.

Annuals or perennials, the latter often with somewhat creeping-ascending rootstocks bearing rosettes of spatulate-lanceolate or somewhat ovate leaves from which arises one sparsely leafy, bracteate or naked stem (or this sometimes apparently lacking) with solitary or few (generally) erect or often nodding flowers, or the inflorescence well developed, but not in the Peruvian species. Calyx 10–many-nerved, often inflated. Styles 3–5. Ovary if not 1-celled more or less 3–5-celled toward the base, or the capsule not clearly more than 1-celled. Capsule valves usually twice as many as the styles.—The inclusion of *Melandrium* (see Harms, Pflanzenfam. ed. 2. 16c: 341 for a discussion of the spelling) in *Silene* as a section does not preclude, for those who wish, the grouping together of the species with partially more than 1-celled ovary without the inconvenience of two group names for plants that otherwise, both as regards aspect and technical characters, are identical. The present nomenclatorial confusion (cf. *S. thysanodes*, for example) is thus avoided, and one definite group name is available for those whose interest in the plants extends no further. Logically *Lychnis* L. could be united, for reasons of tradition, together with the certain aspect many species have, but it may conveniently be kept distinct even as *Stellaria*, *Cerastium*, and *Arenaria* are arbitrarily maintained. Pax and Hoffmann, op. cit. 345, quote Fries' remark made even in 1843 as to the difficulty of separating *Melandrium*, *Viscaria*, and *Heliosperma;* there is obviously one natural genus made difficult to recognize by adopting sectional characters as generic. Besides the following species, the *Index Kewensis* records an *S. Aucheriana* Boiss. for "Peru," evidently a misprint for Persia.

Plants annual.

Flowers paniculate; stems usually glandular-banded at the internodes.....*S. antirrhina.*

Flowers racemose; stems not glandular-banded.....*S. gallica.*

Plants perennial.

Cespitose plants, the flowers sessile in the rosettes of leaves. *Melandrium Mandonii.*

Stems well developed, even in flower, sometimes scapose.

Pubescence even of the calyx obscurely if at all glandular.

Seeds with a narrow, inflated margin; petals obtusely auricled, exserted ..... *S. andicola.*

Seeds emarginate; petals usually acutely auricled. *Melandrium chilense.*

Pubescence definitely glandular, especially below the calyx. *S. thysanodes.*

Silene andicola Gill. in Hook. Bot. Misc. 3: 147. 1833. *Melandrium andicolum* Rohrb. Linnaea 36: 221. 1869. *Lychnis andicola* Britton, Bull. Torrey Club 16: 61. 1889.

Plants with a creeping, woody caudex, producing leafy rosettes and sterile, erect shoots; lower leaves rosulate, linear-lanceolate, acuminate, glabrous except the ciliate margins, the cauline leaves nearly linear; flowers mostly erect, solitary or few, short-pedicellate; calyx ovate-turbinate, inflated, densely pubescent, the nerves biparted at the base; calyx teeth one-third to one-half as long as the tube, lanceolate, acutish, densely lanuginose-ciliate; petals white, obtusely auricled, the blade sometimes bifid, with 2 minute appendages; capsule ovate-oblong; seeds narrowly margined. Neg. 30181.

Junín: Huarón, rocky slopes, *1118;* wet rock ledges, *1146.* Casapalca, loose soil of alpine basin slopes, 5,000 meters, *834.* La Quinua, *Poeppig.* Bolivia; Chile.

Silene antirrhina L. Sp. Pl. 419. 1753.

Similar to *S. gallica,* but usually simple and generally well marked by a dark, glutinous band in each internode.

Peru: (Probably). Cosmopolitan.

Melandrium chilense (C. Gay) Rohrb. Linnaea 36: 222. 1869. *Lychnis chilensis* C. Gay, Fl. Chil. 1: 256. 1845.

Stems simple, erect, somewhat hirsute, from a thick, ascending caudex; leaves lanceolate, linear, acute or obtusish, attenuate at the base, puberulent and densely ciliate, the few cauline leaves ovate-acuminate; flowers erect or somewhat nodding, solitary or with 1 or 2 lateral ones; calyx little inflated, ovoid, densely pubescent; petals white or violet, the blade bifid; seeds tuberculate.—Var. *cucubaloides* (Fenzl) Hoss. Trab. Inst. Bot. Farm. Buenos Aires 33. 1915 (*M. cucubaloides* Fenzl ex Rohrb. op. cit. 223), is distinguished principally by the obtuse auricles.

Ancash: Hacienda Cajabamba, 3,000 meters, *Weberbauer 3169* (det. Muschler as *M. cucubaloides*). Samanco, 3,700 meters (*Weberbauer 171*).—Junín: Tarma, 4,000 meters, *Weberbauer.* Chichla,

3,720 meters, *Weberbauer 243* (det. Muschler as *M. cucubaloides*). Near Huancayo, 4,700 meters, *Killip & Smith 22082.*—Huánuco: Chasqui, moist cliff edges, *3290.*—Lima: Río Blanco, steep, grassy slopes, *666, 2961; Killip & Smith 21610.* Chile.

Silene gallica L. Sp. Pl. 417. 1753.

An erect, villous-viscid annual, generally much branched, 10–20 cm. tall; leaves spatulate, obtuse, mucronate, 1–3 cm. long; flowers in one-sided racemes; calyx ovoid, 7–9 mm. long, slightly exceeded by the white or pinkish petals; capsule included.—All determinations by Wolff.

Lima: Matucana, 3,200 meters, *316, 330; Weberbauer 5728;* 91. Tambo de Viso, *Weberbauer 136.* Río Blanco, *699.* Barranco, 300 meters, *Weberbauer 1651.* Lima, *Ruiz & Pavón* (det. Mattfeld).—Amazonas: Chachapoyas 2,700 meters, *Williams 7544.*—Huánuco: Huánuco, *2093.*—Cajamarca: At 2,200 meters, *Weberbauer 3861.* Introduced from Europe.

Melandrium macrocalyx Muschl. Bot. Jahrb. 45: 441. 1911.

Perennial, with a solitary, nearly or quite erect, densely long-pubescent stem about 30 cm. high, branching above; basal rosulate leaves lanceolate, narrowed to a petiolar base, acute, 3.5 cm. long, 0.5–1 cm. broad, green, on the margin and midnerve densely pubescent; flowers cymose, on pedicels 3–4.5 cm. long, these more or less curved below the calyx, densely brown-pubescent; calyx broadly tubular-campanulate, the evident nerves pubescent like the stems, the teeth triangular; petals 2-parted, obliquely truncate, the broad lobes approximate, purplish; capsule ovoid, included in the ventricose calyx; seeds globose-reniform, black-tuberculate.

Cajamarca: Prov. Hualgayoc, 3,100 meters (*Weberbauer 4015*, type).

Melandrium Mandonii Rohrb. Linnaea 36: 222. 1869.

Densely cespitose from a woody caudex, the flowers sessile in the rosulate leaves, these linear-lanceolate, obtusish, membranously connate at the base, densely scabrous-ciliate, otherwise glabrous; calyx short-campanulate, glabrous, the teeth one-third to one-half as long as the tube, lanceolate, recurving, densely ciliate; petals white, obtusely auricled, the appendages minute; capsule ovoid-campanulate; seeds smooth, broadly margined.—*M. Rimbachii* Mattf. Notizbl. Bot. Gart. Berlin 10: 115. 1927, has a densely tomentose calyx, the short stems lengthening in fruit to even 10 cm. tall.

—Doubtfully more than the alpine, reduced state of *S. andicola*. Neg. 27700.

Lima: Stony, grassy hillsides, 5,000 meters, *2980*. Bolivia.

Melandrium rhizophorum Muschl. Bot. Jahrb. 45: 452. 1911.

Perennial from very tortuous rhizomes to 6 cm. long and 5 mm. thick, bearing a caudex clothed with the remains of the rosulate basal leaves from which arises an erect or suberect, short-pubescent stem; leaves ovate-lanceolate, gradually narrowed to a petiole 5–10 mm. long, somewhat acute, glabrous beneath, more or less densely scaly-puberulent above, the margins densely ciliate, yellowish, somewhat fleshy, 2–3 cm. long, 1–2 cm. broad; pedicels 2–2.5 cm. long; petals yellowish purple; seeds globose; otherwise like *M. macrocalyx* Muschl.—Differs from *M. thysanodes* in that the pedicels and calyx are not glandular (Hieronymus in Herb. Berlin).

Lima: At 4,500 meters, above Lima (*Weberbauer 5098*).

Silene thysanodes Fenzl in Endl. Stirp. Nov. Dec. 4: 31. 1839. *Melandrium thysanodes* Gray, U. S. Expl. Exped. 114. 1854. *Lychnis thysanodes* Hook. f. Fl. Ant. 246. 1844–47.

A cespitose perennial with ascending, 1–few-flowered stems sometimes 15 cm. high, glandular-pubescent, especially above; leaves lanceolate or the lower spatulate, ciliate-tomentose and glandular as also the peduncle and calyx, the last broadly campanulate, 8 mm. long, 5-parted to the middle, the ovate, obtuse lobes very tomentose-ciliate; petals about a third longer than the calyx, purplish, with 2 minute appendages or these obsolete; stamens 10, woolly at the very base, inserted in a fleshy disk, free from the 1-celled ovary; styles 5; capsule about equaling the calyx, 5-valved, the valves 2-cleft; seeds smooth, with a wide and thickish or inflated wing.—The description is by Gray, based on the Wilkes material; the type from Ecuador is described as having 3 styles and partly 3-celled ovary, thus it must be a true *Silene* and probably the Peruvian plant of Gray represents another species, perhaps one of those proposed by Muschler.

Junín: Above Baños and Alpamarca (*Wilkes Exped.*). Edge of grassy bank, *2007* (apparently the species as interpreted by Gray). Chinche, 4,000 meters, bunchgrass slope, *1259* (like *No. 2007*). Colombia.

Melandrium Weberbaueri Muschl. Bot. Jahrb. 45: 442. 1911.

Perennial from a stout taproot; caudex much branched, clothed with leaf remains, glabrous, with internodes 2–20 mm. long; leaves

densely rosulate, linear or rarely lanceolate, with the rather long petiole 3–5 cm. long, 5–7 mm. broad; bractlets minute; pedicels 1 cm. long, mostly glabrous; petals yellowish white; otherwise like *M. macrocalyx*.

Junín: Near Yauli, 4,400 meters (*Weberbauer 337*, type).

68. NYMPHAEACEAE. Water-lily Family

By Paul C. Standley

Reference: Caspary in Mart. Fl. Bras. 4, pt. 2: 130–184. 1878.

Perennial, aquatic plants, acaulescent or with elongate stems, the leaves floating or submerged; flowers perfect, terminating elongate scapes or solitary in the leaf axils; sepals 3–6; petals 3 to many, often gradually passing into stamens or staminodia; stamens few or numerous; ovary of few or numerous free or united carpels, the stigmas sessile or united to form a disk with radiating stigmatic lines; fruit indehiscent, of distinct or united carpels.—Caspary, op. cit., gives a questionable report of the genus *Victoria* from the Río Ucayali; see also Rev. Hort. 405. 1866.

Plants acaulescent; leaves floating, deeply cordate at the base, entire or nearly so ..... 1. *Nymphaea.*

Plants with elongate stems; leaves mostly submerged and dissected into capillary segments ..... 2. *Cabomba.*

1. NYMPHAEA L. Water-lily

Reference: Conard, The Waterlilies: A monograph of the genus *Nymphaea*. Carnegie Inst. Wash. Publ. 4. 1905.

Coarse, perennial herbs with thick, fleshy, horizontal rootstocks; leaves floating, large, deeply cordate at the base, entire or somewhat undulate or coarsely dentate; flowers large and showy.—It is probable that other species of the genus may be found in eastern Peru.

Leaves thick, red-purple beneath, usually undulate or somewhat dentate; flowers open during the day ..... *N. ampla.*

Leaves thin, green beneath, entire; flowers open only at night. *N. blanda.*

Nymphaea ampla (Salisb.) DC. Syst. 2: 54. 1821. *Castalia ampla* Salisb. Parad. Lond. 1: *pl. 14*. 1805.

Leaves 15–46 cm. in diameter, coarsely sinuate-dentate or almost entire; flowers white, raised above the water, 8–16 cm. broad, very showy; sepals oblong-lanceolate, obtuse or acutish, the outer surface green with purple-black lines; petals 12–21.

Loreto: Balsapuerto, open swamp, 150–350 meters, *Killip & Smith 28682*. Widely dispersed in tropical America, extending northward to Texas and the West Indies. Probably common in eastern Peru.

Nymphaea blanda Mey. Prim. Fl. Esseq. 201. 1818.

Plants smaller and more slender than those of the preceding species; leaves mostly 10–15 cm. long, broadly rounded at the apex, thin, green on both sides; flowers creamy white, 8–9.5 cm. broad, the sepals 3.5–4.5 cm. long, green; petals 16.—Illustrated, Mart. Fl. Bras. 4, pt. 2: *pl. 36, f. 9–16*.

Loreto: Iquitos, in pool, 100 meters, *Killip & Smith 27173*. Ranging northward to Central America.

2. CABOMBA Aubl.

Slender, mostly submerged plants; leaves of two kinds, the submerged opposite or verticillate, palmately dissected into numerous capillary segments, the floating leaves (usually absent) few, alternate, centrally peltate; sepals and petals each 3; stamens 3–6; fruit of 2–4 indehiscent carpels.

Cabomba aquatica Aubl. Pl. Guian. 1: 321. *pl. 124*. 1775.

Stems often much elongate; submerged leaves opposite or verticillate, usually long-petiolate, the floating leaves elliptic; flowers axillary, pedunculate, 1–1.5 cm. broad, yellow.—Illustrated, Mart. Fl. Bras. 4, pt. 2: *pl. 37*.

Loreto: Río Itaya above Iquitos, floating in river, 110 meters, *Killip & Smith 29282*. Widely distributed in tropical America.

69. RANUNCULACEAE. Buttercup Family

The visitor to Peru from a northern land may enjoy the thrill of seeing some of the largest buttercups that grow, the remarkable *Laccopetalum giganteum* and *Krapfia Raimondii*. Their handsome leaves 40–70 cm. long and huge flowers, that measure to 10 cm. across and even larger, place them among the notable plants of their group. The buttercup family in Peru includes a number of genera that even the most casual student may recognize, as *Caltha* and *Clematis*, *Anemone*, and *Thalictrum*, not to mention many sorts of yellow buttercups that, unless one is a professional botanist, appear like those at home, if that is in a northern clime. In the preparation of the following compilation I acknowledge especially my indebtedness to the work of Weddell and of Ulbrich.

Carpels 1-ovuled, the fruit a head of achenes.
Plants not scandent, herbaceous.
Sepals unappendaged.
Sepals 5–many, petaloid; petals none.
Low, tufted, alpine perennials, the leaves not fern-like.
Leaves divided.....1. *Anemone.*
Leaves entire.....2. *Capethia.*
Tall perennials of middle altitudes with compound leaves. 3. *Thalictrum.*
Sepals 5, herbaceous or petaloid, but petals present, usually 5–many.
Receptacle rather disk-like, not clavate, the gynophore woody or spongy, the perianth caducous. 5. *Ranunculus.*
Receptacle fleshy, somewhat clavate, the perianth persistent.
Petals thin, with one nectary.....6. *Krapfia.*
Petals fleshy, foveolate with many nectaries. 7. *Laccopetalum.*
Sepals spurred; fruiting receptacle spike-like...8. *Myosurus.*
Plants scandent, fruticose.....4. *Clematis.*
Carpels many-ovuled, the follicular fruits dehiscent; sepals 5, petaloid; petals none; leaves appendaged at the base.....9. *Caltha.*

1. ANEMONE L.

Petals none. Flowers often cymose. Low perennials with erect scapes.—Growing on rock outcrops, at 2,200–3,600 meters.

Achenes glabrous, in globose heads; divisions of the leaves broad. *A. helleborifolia.*

Achenes densely tomentose or sericeous, the heads elongate-oblong; divisions of the leaves narrowly linear.....*A. triternata.*

Anemone helleborifolia DC. Syst. 1: 211. 1818. *A. aequinoctialis* Poepp. Fragm. Syn. Pl. Chile 28. 1833. *A. peruviana* Britton, Ann. N. Y. Acad. Sci. 4: 225. 1892(?).

Radical leaves subcoriaceous, numerous, arising from a fleshy, densely fibrillose caudex; petiole 7–10 cm. long, pilose, the leaf blade pedatisect, the glabrous, thickish, cuneately petiolulate divisions trifid, their acute lobes serrate, sometimes nearly trifid;

stems erect, fistulose, 30 cm. high or more; umbel compound, usually 3–4-radiate, the elongate peduncle glabrous; involucres all 3-foliate, subsessile; flowers white; sepals 5, oval; achenes glabrous, nearly oblong, turgid, distinctly stipitate, gibbous, with a short, strongly revolute or hooked style, forming a globular head, the receptacle villous.—Description of achenes by Gray, who records that the leaves may be thin or more or less coriaceous. Ulbrich, Bot. Jahrb. 37: 237. 1905, remarks that from description *A. peruviana* seems to be "only a form." It was based on *Mathews 537* and *McLean.*

Huánuco: Piedra Grande, 1,500 meters, *3689.* Huánuco (*Dombey; Ruiz*). Cajabamba, *Weberbauer 3150* (det. Ulbrich).—Junín: Palca, 2,700 meters, *Weberbauer 1788;* 247 (det. Ulbrich). Huasahuasi (*Dombey*). Tarma (*Ruiz & Pavón*).—Lima: Huaros, 3,500 meters, *Pennell 14729.* Matucana, *479; Weberbauer 196* (det. Ulbrich). Obrajillo, Baños (*Wilkes Exped.*).—Cajamarca: San Pablo, *Weberbauer 3862* (det. Ulbrich). San Pablo, 2,200 meters (Weberbauer, 257).—Ancash: Above Samanco, 3,000 meters (Weberbauer, 169).—Cuzco: Paucartambo, 3,500 meters (*Herrera 1395,* as *A. decapetala* L.).—Ollantaitambo, 2,800 meters, *Herrera 3404.*—Without locality, *Weberbauer 6490.*—Puno: Sandía, 3,000 meters (Weberbauer, 237). "Polizonis," "Solimán," "arracacha cimarrona."

Anemone triternata Vahl, Symb. 3: 74. *pl. 65.* 1794.

Radical leaves long-petiolate, much divided into numerous very narrow, slender segments, almost glabrous; stems about 30 cm. high, slender, 1-flowered, the much-divided involucre borne above the middle; sepals 10–12, white, linear-oblong; fruit heads very densely sericeous.

Cuzco: Colinas del Sacsahuamán, 3,600 meters, *Herrera 2362.* Extending to Brazil, Argentina, and Chile.

2. CAPETHIA Britton

A small, depressed plant with entire leaves and solitary flowers. Fruit indehiscent, ligneous. Flowers with both involucre and calyx. Otherwise similar to *Anemone.*

Capethia integrifolia (DC.) Britton, Ann. N. Y. Acad. Sci. 6: 234. 1891. *C. Weddellii* Britton, op. cit. 235(?). *Anemone integrifolia* HBK. ex Wedd. Chlor. And. 2: 298. 1857. *Hepatica integrifolia* DC. Syst. 1: 217. 1818.

Petioles and scapes densely villous with long, white hairs; radical leaves many, coriaceous, ovate, subacute, entire, somewhat pubes-

cent; involucral leaves none or merged with the many sepals, these lanceolate or linear; carpels villous, ovoid, 3 mm. long.—Petals and scapes very short, the flowers large, or the scape sometimes 2–3 cm. high, the flowers then smaller (Weddell). Flowers white or yellow! (Ulbrich, Bot. Jahrb. 37: 401. 1905). Illustrated (as *C. Weddellii*), Wedd. Chlor. And. 2: *pl. 83.*

Cajamarca: Between Micuipampa and Hualgayoc, 3,600 meters (*Humboldt & Bonpland*, type). Hualgayoc, 4,000 meters (Weberbauer, 271).—Cuzco: (*Gay*).—Huánuco: Chavanillo, dry, grassy slope, 2,400 meters, *1965.*—Puno: Sachapata (*Lechler 2706*). Bolivia; Ecuador.

3. THALICTRUM L.

Reference: Lecoyer, Bull. Soc. Bot. Belg. 24: 78–324. 1885.

This well-known genus is represented in Peru by only 4 closely related species, all characterized by 2–4-pinnate leaves, the leaflets small and in greater or less degree paler beneath. The oblong-oval perianth segments are, with the stamens, greenish yellow or more or less lined or tinged with purple.

Styles 4–5 mm. long or longer; leaflets mostly not regularly 3-lobed or 3-toothed.

Leaflets stipellate.

Achenes slender-veined; leaf sheaths ovate-lanceolate. ..... *T. longistylum.*

Achenes coarsely nerved, the nerves thick or nodose; leaf sheaths ample, broadly ovate ..... *T. vesciculosum.*

Leaflets estipellate ..... *T. rutidocarpum.*

Styles about 3 mm. long; most of the leaflets regularly 3-lobed or 3-toothed ..... *T. podocarpum.*

Thalictrum longistylum DC. Syst. 1: 171. 1818; 126.

Leaflets often somewhat pubescent, subentire or usually with 1–several teeth of unequal size, stipellate; anthers finally 4–6 mm. long; achenes stipitate or sometimes subsessile, reticulate-costate, enodose.—The type by Dombey ("Am. merid.") was probably from Peru. Illustrated, Deless. Icon. *pl. 7;* Lecoyer, op. cit. *pl. 2* (fruit).

Lima: Cheuchín: *Ruiz & Pavón.* Purruchuca (*Mathews*). Viso, 2,600 meters, *Weberbauer 144;* 169. Matucana, shrubby thicket, 2,400 meters, *409.* Canta, open, rocky slope, 3,000 meters, *Pennell 14338.* Río Blanco, 3,000–3,500 meters, open hillside, *Killip & Smith 21572.* Bolivia to Mexico.

Thalictrum podocarpum HBK. Nov. Gen. & Sp. 5: 38. 1821; 129.

Glabrous; leaflets mostly very evenly 3-lobed across the tip, stipellate; anthers finally 4–6 mm. long; achenes sessile or subsessile, reticulate-nerved, compressed.—Illustrated, Lecoyer, op. cit. *pl. 2.*

Cajamarca: Ocros, 3,000 meters, *Weberbauer 2739.*—Lima: Matucana, 2,400 meters, *269.* Near Viso (Weberbauer, 169).—Amazonas: Region of Moyobamba (Weberbauer, 266; 267).—Huánuco(?): Río Chiquién (Weberbauer, 178).—Huánuco: Tambo de Vaca, 3,600 meters, *4466.*—Junín: Near Huancayo, open, rocky hillside, 3,400 meters, *Killip & Smith 22125.*—Cuzco: Colinas del Sacsahuamán, 3,200–3,600 meters, *Herrera 829.* Urubamba, *Soukup 40.* Quiquijana, 3,220 meters, grassy wayside, *Pennell 13540.* Hacienda Churu, Prov. Paucartambo, 3,500 meters, *Herrera 1047a.* Bolivia to Venezuela.

Thalictrum rutidocarpum DC. Syst. 1: 172. 1818; 127.

Allied to *T. longistylum,* but the small leaflets estipellate and pubescent and the achenes nodose.—The type from "Am. merid." by Dombey may well have come from Peru, to which country Lecoyer accredits it.

Peru: Probably. Ecuador.

Thalictrum vesiculosum Lecoyer, Bull. Soc. Bot. Belg. 24: 130. 1885.

Glabrous; leaflets sometimes 3-toothed but not usually nor as regularly as in *T. podocarpum,* stipellate; anthers 3 mm. long or finally often much longer; achenes stipitate.—The salient and perhaps single constant character of this species is found in the achene nervation, which is strongly marked. Illustrated, Lecoyer, op. cit. *pl. 2.*

Amazonas: Chachapoyas, *Mathews.*—Puno: Sandía Valley, *Weberbauer 553;* 237. Bolivia to Colombia.

4. CLEMATIS L.

Reference: Eichler in Mart. Fl. Bras. 13, pt. 1: 143–150. 1864.

These familiar vines, characterized by opposite, pinnately compound leaves, the leaflets usually more or less toothed, petaloid sepals but no petals, and achenes conspicuous by the persistent, plumose or silky, elongate style, are obscurely separable in Peru into several species that more probably represent races of fewer

forms. The following key, only general in character, is at best merely suggestive. The questionable *C. Seemanni* Kuntze, not seen, is omitted.

Leaves finely dissected, at least many of the leaflets about 1 cm. wide or smaller or even filiform or, when wider, acuminate.

Leaflets or their divisions linear-filiform.....*C. millifoliolata.*

Leaflets at least 5–15 mm. wide.

Leaflets glabrous or sparsely pubescent beneath; petaloid filaments lacking; leaflets often only 3–5 mm. wide. *C. parvifrons.*

Leaflets more or less distinctly pubescent beneath, often larger; petaloid filaments often present.....*C. peruviana.*

Leaves with ample leaflets mostly 2–3 cm. wide, coarsely lobed or entire.

Leaves evenly and usually densely pubescent beneath..*C. sericea.*

Leaves glabrous or sparsely and unevenly pubescent beneath.

Flowers reddish white, the segments barely 10 mm. long; most of the leaflets irregularly roundish-lobed.....*C. alborosea.*

Flowers greenish or yellowish white, often longer; leaflets entire or more or less equally 3-lobed.

Leaflets more or less lobed or toothed.

Leaflets rather regularly 3-lobed.....*C. Hilarii.*

Leaflets irregularly and remotely lobed or toothed. *C. campestris.*

Leaflets entire or mostly so.....*C. dioica.*

Clematis alborosea Ulbrich, Notizbl. Bot. Gart. Berlin 8: 325. 1923.

Leaves once or twice trifoliolate, 10 cm. long or longer, the ovate or obliquely ovate, irregularly and deeply crenate terminal leaflets to nearly 6 cm. long and broad, the lateral ones smaller; inflorescence ample, glabrous or the flowers sparsely pilose; sepals 5–6, to 12 mm. long and 4–5 mm. wide; filaments glabrous, 7–8 mm. long; pistillate flowers unknown.

Junín: Near Comas, below Hacienda Runatullu, 3,300 meters, *Weberbauer 6609* (type).—Cajamarca: Nanchó, *Raimondi*(?).

Clematis campestris St. Hil. Fl. Bras. 1: 4. 1825; 145.

Stems 6-angled, 1-striate between the angles, tomentose, becoming glabrescent; petioles divaricate, flexuous or cirrose; leaves pinnate,

15 cm. long or longer, with 2–5 pairs of leaflets, these ternate, cordate-lanceolate or linear, attenuate, acute, entire; panicles shorter than the leaves, 3–5 or rarely 7-flowered; upper bracts oblong-linear; bractlets remote, lanceolate, flowers perfect, 12–18 mm. broad; petals lanceolate, grayish-tomentose within or without.—By Kuntze regarded as *C. dioica*, sens. lat. Illustrated, Mart. Fl. Bras. 13, pt. 1: *pl. 33, 35.*

Moquehua: Moquehua, climbing over stone walls, 1,500 meters, *Weberbauer 7452.* Southern South America and Brazil.

Clematis dioica L. Amoen. Acad. 5: 398. 1759; Sp. Pl. ed. 2. 765. 1762; 147. *C. thalictroides* Steud. Flora 39: 407. 1856. *C. Haenkiana* Presl, Rel. Haenk. 2: 69. 1831(?), fide Kuntze.

Stems 10–12-angled, glabrous as the entire plant or more or less tomentose; leaves simple to pinnate with 3 pinnae, the leaflets ternate, entire or dentate, ovate or ovate-cordate, acute or acuminate; panicles as long as or often longer than the leaves.—Very variable; description by Eichler. The Isern specimen seems to approach *C. sericea.*

Amazonas: Chachapoyas (*Mathews*).—Lima: Matucana, 2,400 meters, *398.* Quive, 800–1,200 meters, in thickets, *Pennell 14295.* Near Viscas, 2,100 meters, in thicket, *Pennell 14448.* Baños (*Wilkes Exped.*). Matucana, *Isern 2086.*—Cajamarca: Above Supi, 1,600 meters (Weberbauer, 162). Huaraz, 2,200 meters (Weberbauer, 172); at 2,400 meters (Weberbauer, 173).—Ayacucho: Carrapa, wooded hillside, 1,200 meters, *Killip & Smith 23225, 22316.*—Cuzco: Hacienda Chancamayo, Valle Lares, *Diehl 2462.* Machupicchu, 2,400 meters, *Herrera 2005.* Below Pillahuata, 2,200 meters, in forest, *Pennell 14061.*—Huánuco: Muña, 2,100 meters, *3986, 3901.* Yanano, 1,800 meters, *3727.* Llata, 2,100 meters, on shrubs along stream, *2260.* Cani, 2,550 meters, on shrubs in sun, *3474.*—Junín: Huacapistana, 1,800–2,400 meters, *Killip & Smith 24329.* Colonia Perené, 680 meters, in thicket, *Killip & Smith 25050.*—Loreto: Balsapuerto, 220 meters, *Klug 2922.*—San Martín: Zepelacio, 1,200–1,600 meters, *Klug 3526, 3465.* San Roque, 1,400 meters, *Williams 7770.*—Without locality: *Weberbauer 5377.* Widely distributed in tropical America.

Clematis Hilarii Spreng. Syst. Veg. 5: 177. 1828; 146.

Similar to *C. campestris*, but the leaves more or less ternate, the leaflets mostly 3-lobed, the lobes very acute.—Treated as a subspecies of *C. dioica* by Kuntze.

Peru: Probably. Mexico to Uruguay.

Clematis millifoliolata Eichl. in Mart. Fl. Bras. 13, pt. 1: 150. 1864.

Gray-tomentose, or the 6-angled, striate stem finally glabrescent; leaves 10–12 cm. long and broad, the ultimate segments only 2–4 mm. long, linear-lanceolate; panicles scarcely equaling the leaves, 3–7-flowered; bracts filiform, the bractlets broadly ovate-cordate, 3-lobed, densely villous-tomentose like the sepals, these 4, elliptic-cordate, pubescent within below the apex, about equaled by the stamens.

Peru: (*Besser*, type).—Moquehua: Carumas, 3,200 meters, climbing in thicket of moist ravine, *Weberbauer 7288*.—Arequipa: Nevado de Chachani, open, rocky ravine, 3,600 meters, *Pennell 13263*.

Clematis peruviana DC. Syst. 1: 141. 1818.

Stems terete, somewhat purplish, pubescent; petioles terete, pubescent; leaves bipinnatifid, the segments sometimes ternate, sometimes 3-parted, ovate at the base, acutely incised, dentate above, glabrous or pubescent on the upper surface, villous beneath; peduncles axillary, as long as the leaves, sparsely branched, few-flowered, the opposite branchlets 1-flowered; bracts oval, subacute, entire; flowers subpaniculate, polygamous, some staminate, others perfect; sepals 4, widely spreading, ovate-oblong, acute, nearly twice longer than the stamens, these sometimes very many, sometimes few, the glabrous filaments finally reflexed; anthers oval; ovaries about 40.

Peru: Without locality (*Dombey*, type).—Lima: Baños (*Wilkes Exped.*). Obrajillo, Cullnai (*Cruckshanks*). Lima, 3,500 meters (Weberbauer, 170; 169).—Ayacucho: Between Chavina and Coracora, 3,100 meters, *Weberbauer 5786*.—Cuzco: (*Herrera*, det. Ulbrich).—Huánuco: Río Marañón region, 3,300 meters (Weberbauer, 178). Río Blanco, 3,000–3,500 meters, open hillside, *Killip & Smith 21563*. Huaros, 3,400 meters, open, rocky banks, *Pennell 14706*. Canta, 3,300 meters, rocky thickets, *Pennell 14617*. Viso, 2,700 meters, trailing over shrubs, *575*.

Clematis parvifrons Ulbrich, Notizbl. Bot. Gart. Berlin 8: 326. 1923.

Glabrous except the young parts and the lightly pilose, rotund-elliptic perianth segments, these 8 mm. long; leaves bipinnate or tripinnate, the segments acutely toothed, ovate-lanceolate or suborbicular; stamens scarcely 4 mm. long; fruit glabrous, ovoid, 4–5 mm. long, the styles about 4 cm. long, rather laxly pilose.—The native name means "winding here and there" (Weberbauer).

Ayacucho: Hacienda Totorabamba, 3,500 meters, *Weberbauer 5464* (type). Huanta, 3,500 meters, *Weberbauer 7488, 7488a*; *Killip & Smith 23325*. Prov. Cangallo, *Raimondi*.—Cuzco: Huasao, 3,300 meters, *Herrera*. Sacsahuamán, 3,500 meters, *Herrera; Soukup 80*. —Arequipa: Near Ancará and Calfara, *Raimondi*. "Arhuiarhui."

Clematis Seemanni Kuntze, Verh. Bot. Ver. Brandenb. 26: 146. 1885.

Branches short, with many crowded, few-flowered branchlets; leaflets lobed or 2-parted, sometimes biternately bipinnate, the ultimate divisions small, ovate, not at all dentate, glabrous; peduncles longer than the leaves; sepals 5–6, oblong, obtuse, 1–1.5 cm. long; bracts none or narrow.—Probably a race of *C. dioica*, sens. lat., or of *C. peruviana*.

Common about the village of Andahuageas (*Pearce*, type).—Lima: Obrajillo, San Mateo (*Mathews*). Bolivia(?).

Clematis sericea DC. Syst. 1: 144. 1818.

Similar to *C. dioica*, but the many cauline leaves pinnate, usually densely pubescent and evenly so beneath, the leaflets entire, dentate, or more or less divided.—*C. brasiliana* DC. Syst. 1: 143. 1818, regarded as a subspecies of *C. dioica* by Kuntze, seems to be the form with entire or few-dentate leaflets ranging from Mexico to Uruguay through all tropical America (Kuntze). Kuntze treats this as a subspecies of *C. dioica*, and credits it to Peru.

Puno: Sandía Valley, 2,000–3,000 meters (Weberbauer, 237); *6589*.—Cuzco: Valle del Apurímac, *Herrera* in 1929. Paucartambo to Tres Cruces, 3,300 meters, in thicket, *Pennell 14150*.—Huánuco: Huacachi, 1,950 meters, *4098*. Mito, 2,700 meters, on shrubs in sunny places, *1553*. North to Mexico and south to Argentina.

5. RANUNCULUS L. Buttercup

Reference: Weddell, Chlor. And. 2: 297–307. 1857–62.

This almost universally distributed group requires no characterization here. It is interpreted to include *Oxygraphis*, which is at least a convenient disposition for practical purposes. Several of the following species are doubtfully distinct, but a revision of all the Andean forms is needed before they can be properly disposed.

Plants aquatic.

Floating leaves more or less lobed and cordate . . . *R. trichophyllus*.

Floating leaves entire, not cordate . . . . . *R. Mandonianus*.

Plants terrestrial (*R. flagelliformis* sometimes subaquatic).

Leaves all alike, the plants tufted or creeping, glabrous or rarely slightly pilose.

Leaves entire or barely crenate, cordate-rotund or truncate at the base, often 1.5–2.5 cm. wide; flowers small; plants creeping..... *R. flagelliformis, R. sarmentoso-repens.*

Leaves rarely entire, the plants then tufted and the flowers large; leaves usually at least crenate, sometimes 3–5-parted.

Leaves mostly more or less crenate or lobed; flowers small.

Plants glabrous.

Flowers yellow or yellowish; leaves rarely lobed. *R. Cymbalaria.*

Flowers white; leaves 3–5-lobed..... *R. hemignostus.*

Plants slightly hairy.

Leaves crenate..... *R. nubigenus.*

Leaves 3–5-parted..... *R. breviscapus.*

Leaves entire; flowers nearly 10 mm. wide... *R. arequipensis.*

Leaves often dissimilar; stems or cauline leaves or both developed and the latter often differing from the basal leaves, or at least the plants pubescent.

Leaves, at least, glabrous or nearly so, the basal ones not parted or deeply lobed.

Basal leaves cordate-rotund, crenate; achenes not muricate.

Sepals densely villous..... *R. peruvianus.*

Sepals glabrous or lightly pilose..... *R. bonariensis.*

Basal leaves flabellate, coarsely toothed; achenes muricate. *R. muricatus.*

Leaves, as the stems, usually pubescent, deeply 3-lobed, trifid, or pinnate.

Leaves trifid or deeply 3–5-lobed or, if subpinnate, the plants low and tufted (*R. sibbaldioides*).

Stems well developed.

Leaves mostly or usually only deeply 3–5-lobed, or, in any case, the plants erect or suberect.

Leaf lobes, at least the middle one, deeply 3-lobed or twice cleft.

Basal leaves mostly or all ternate.... *R. geranioides.*

Basal leaves palmately 3–5-parted nearly to the base. *R. acris.*

Leaf lobes merely toothed..... *R. chilensis.*

Leaves all or some of them trifid, the plants spreading-repent..... *R. repens.*

Stems not obvious, the peduncle 3–4 cm. high, little if at all exceeding the leaves.

Calyx spreading..... *R. sibbaldioides.*

Calyx appressed..... *R. breviscapus.*

Leaves more or less pinnately lobed or divided; plants tall.

Plants usually markedly pubescent, with coarsely divided, dissimilar leaves.

Uppermost reduced leaves usually 2 or more; plants often tall, stout, and stiff.

Petals obovate; style straight or nearly so.

Petals 5–6; style straight..... *R. pilosus.*

Petals 10; style a little inclined.. *R. argemonifolius.*

Petals oblong-cuneate; style often recurved. *R. chiclensis.*

Uppermost reduced leaf often bract-like; plants often relatively lax and low. *R. praemorsus, R. setoso-pilosus.*

Plants sparsely appressed-pilose, with finely divided leaves, the ultimate segments often only 1–2 mm. wide. *R. palimbifolius, R. Sodiroi.*

Ranunculus acris L. Sp. Pl. 554. 1753.

More or less strigose-hirsute, several dm. tall; basal leaves 3–several cm. wide, the broadly rhombic divisions twice parted into lanceolate lobes; petals 1 cm. long or longer, at least twice longer than the sepals; achene beak slightly curved, about a fourth as long as the achene.

Peru: Probably. Nearly cosmopolitan.

Ranunculus arequipensis Ulbrich, Notizbl. Bot. Gart. Berlin 8: 326. 1923.

A small, glabrous, stoloniferous herb, the flowering stems tufted; petioles often 2–5 cm. long; leaves 3–8 mm. long, 3–6 mm. broad, almost nerveless; flowers axillary, solitary, the peduncle 2.5–4 cm. long; sepals 3 and 5–6 mm. long; petals mostly 6, oblong-linear,

4–5 mm. long, 1–1.5 mm. broad; carpels very many, nearly 1 mm. long, obliquely obovoid, attenuately stipitate, apiculate.—Related to *R. boliviensis* Phil., with smaller flowers, 5 sepals, and few (12–15) carpels (Ulbrich).

Arequipa: Near Cailloma, 4,500 meters, *Weberbauer 6887* (type). Lake Titicaca, *Meyen*(?).

Ranunculus argemonifolius Griseb. Goett. Abh. 19: 70. 1874.

Perennial, the pilose stems about 60 cm. high, divided above into few-flowered branches; blades of the lower leaves 7 cm. long; leaves distant, pinnatisect, pilose, oblong, the divisions with few pinnae, these broadly cuneate, unequally 3-pinnatifid, the lobes ovate or oblong, callous-tipped, roundish-acute; pedicels terminal and axillary; flowers yellow, the 10 spatulate-oblong, subretuse petals 12–14 mm. long, more than twice as long as the 5 glabrous, reflexed sepals; achenes ovate, compressed, reticulate, the elongate, subulate style a little inclined.—Allied by the author to *R. palimbifolius.*

Junín: Palca, *Isern 2107.* Huacapistana, *Weberbauer 2199.*—Puno: Near Puno, 4,000 meters, *Soukup 15.*—Ayacucho: Yanamonte, 2,700 meters, *Weberbauer 5653.*—Cuzco: Pillahuata, 3,300 meters, open, grassy paramo, *Pennell 14140.*—Huánuco: Mito, 2,700 meters, *1441.* Huacachi, moist grasslands, 1,950 meters, *3887.* Southeast of Huánuco, 3,150 meters, barley field, *2096.*—Junín: Chinche, 3,450 meters, grassy slope, *1264.* La Quinua, 3,600 meters, wet meadow, *2014.*—Lima: Río Blanco, 3,600 meters, along irrigation ditch, *727.* Extending to Argentina.

Ranunculus bonariensis Poir. Dict. 6: 102. 1804.

Glabrous or nearly so, the creeping to erect stems often branched; leaves cordate, orbicular, entire or crenate, dentate, on greatly elongate petioles, the blades to 5 cm. wide or larger; petals usually only 2 or 3, shorter than the finally reflexed, glabrous or slightly pilose sepals; achenes numerous, tiny, not at all compressed, obscurely margined, forming a cylindric head.—Cf. *R. arequipensis.* Illustrated, Deless. Icon. Sel. 1: *pl. 29.*

Peru: Probably. South America.

Ranunculus breviscapus DC. Syst. 1: 253. 1818. *Oxygraphis breviscapa* Prantl, Bot. Jahrb. 9: 263. 1888.

Tufted, with creeping offshoots; basal leaves many, glabrous or pilose, orbicular-cordate, 3–5-parted, the lobes incised-dentate, the

teeth acute; petioles 7 cm. long, the 1-flowered peduncles half as long; flowers small, the petals obtuse; calyx glabrous, appressed.—The type, by Dombey without locality, may be rather from Chile.

Peru: (*Dombey*).

Ranunculus chiclensis Ball, Journ. Proc. Linn. Soc. 22: 28. 1885.

Plants 30 cm. high or taller, the entire plant hirsute with subappressed hairs; radical and lower leaves pinnatifid, the alternate segments 3-parted or pinnate, the upper leaves oblong-cuneate, variously incised; flowers long-peduncled, rather large; petals 5–10; nearly oblong-cuneate, truncate or lightly emarginate, obscurely lineate; achenes compressed, gradually narrowed to the beak, this often but not always recurved.—A very distinct species, especially remarkable by the form of the petals (Ball).

Lima: Chicla (*Ball*).

Ranunculus chilensis DC. Syst. 1: 286. 1818.

Procumbent stems and petioles hispid, the shorter flowering stems densely so, the longer sterile ones sparsely; leaves subvillous, the petioles of the numerous radical leaves hispid, 5 cm. long, the blades orbicular, deeply cordate, 3–5-parted to below the middle, the lobes coarsely dentate apically; petioles of cauline leaves 2.5 cm. long, dilated at the base into a glabrous, membranous sheath; peduncles opposite the leaves, densely pilose, 1-flowered, the flowers small; calyx densely villous.—Flowers 1.5 cm. broad according to Reiche. Neg. 27645.

Huánuco: Tambo de Vaca, 3,900 meters, mossy, rocky uplands, *4386*. Chile.

Ranunculus Cymbalaria Pursh, Fl. Amer. Sept. 392. 1814; 300. *R. tridentatus* HBK. ex DC. Syst. 1: 252. 1818. *Oxygraphis Cymbalaria* Prantl, Bot. Jahrb. 9: 263. 1888.

A diminutive, glabrous annual, usually less than 3 cm. high, cespitose or sometimes the stems elongate and creeping; leaves 2–6 mm. long, ovate or rotund, 3-lobed at the apex or coarsely and obtusely dentate, or merely crenate, rather thick; peduncle usually 1-flowered; sepals and petals 5, the former elliptic, the latter obovate-spatulate, unequal, obtuse; fruit heads ovate, 4–6 mm. long, the achenes very many, minute, compressed, ovate, acute, veiny, acutish-margined.—Compare the doubtfully distinct *R. nubigenus*. Includes, following Weddell and Fries, *R. minutus* Gay, Fl. Chil. 1: 38. 1845. The

diminutive *R. psychrophilus* Wedd. op. cit. 300 is comparable. The Peruvian specimen determined by Ulbrich, "compare *tridentatus*." Leaves vary from 5–20 mm. long (Fries). In wet, probably always saline places.

Puno: *Raimondi*. North America, south in the Andes to Patagonia.

Ranunculus flagelliformis Smith in Rees, Cycl. 29: No. 13. 1802–20.

Glabrous, the weak stems often creeping and rooting at the nodes; leaves long-petioled, orbicular-cordate, entire, obscurely crenate, the petioles to 5 cm. long; peduncles opposite the leaves; flowers white, 2–4 mm. broad; petals 2–3, slightly shorter than the 3–4 finally reflexed sepals; achenes few, elliptic or oblong, bluntly pointed, slightly margined, foveolate under a lens, forming a subglobose head. —Description from Eichler. Illustrated, Mart. Fl. Bras. 13, pt. 1: *pl. 34*.

Lima: Cheuchín, *Dombey*.—Huánuco: Tomaiquichua, 2,550 meters, floating in shallow pool, *2435*. Mito, 2,700 meters, on wet mud, *1537*.—Without locality: *Weberbauer 6931*.—San Martín: Tarapoto, *Spruce 4470*. Southern South America to Colombia.

Ranunculus geranioides HBK. ex DC. Syst. 1: 286. 1818.

Stems ascending, simple, about 10 cm. high, silky-hirsute like the ternate radical leaves, these especially so beneath, 3 cm. broad; leaflets cuneately petiolate, incised-serrate, the rhombic lateral ones 2–3-parted; petiole to 5 cm. long, pubescent like the leaves and with a membranous sheath; cauline leaves more or less 3-parted; flowers generally 2, the pubescent peduncle about 2 cm. long to twice as long and divaricate in fruit; sepals hirsute, reflexed, slightly shorter than the petals; achenes obliquely obovate, compressed, the beak somewhat curved, forming a small, subglobose head.—Illustrated, HBK. Nov. Gen. & Sp. 5: *pl. 427*.

Huánuco: Muña, 2,400 meters, open, wet, grassy places, *4295*. North to Colombia.

Ranunculus hemignostus Steud. Flora 39: 404. 1856.

Glabrous throughout; stems scarcely 2.5 cm. long; petioles elongate, nerved and dilated basally; leaves fleshy, oblong, mostly 3-lobed or rarely 5–many-lobed, the lobes obtuse; flowers solitary, the petals white; achenes numerous, glabrous, marginate, apiculate, forming an ovoid, subrotund head.

Puno: Azángaro (*Lechler 1793*).

Ranunculus Mandonianus Wedd. Chlor. And. 2: 299. 1857.

A glabrous aquatic with the habit of *Alisma natans;* stems elongate, rooting at the nodes; leaves floating, long-petioled, the blades 1.5–2 cm. long, elliptic, obtuse at each end, obsoletely 3-nerved; flowers small, long-pediceled; sepals orbicular; petals 3–4, white, obovate-spatulate, scarcely equaling the calyx, the nectary at the base of the blade; stamens fewer than 5; fruit globose, 4 mm. thick, the achenes oblong-ovate, apiculate, smooth. Neg. 27652.

Ancash: Huaraz, 4,400 meters, *Weberbauer 3108;* 227. Huánuco: Punco, 4,050 meters, *2474.* Mito, 2,700 meters, *3355.* Bolivia.

Ranunculus muricatus L. Sp. Pl. 78. 1753.

A nearly glabrous, erect or diffuse annual, the radical or lower leaves suborbicular or reniform, 3-lobed and coarsely crenate, the upper 3-parted, cuneate at the base; petals slightly longer than the sepals; achenes compressed, many, sharply tuberculate, prominently beaked, with a well-defined, unarmed margin.

Lima: Environs of Lima, *Raimondi.* Nearly cosmopolitan.

Ranunculus nubigenus HBK. ex DC. Syst. 1: 253. 1818; 300. *Oxygraphis nubigenus* Prantl, Bot. Jahrb. 9: 263. 1888.

A diminutive annual with long-petioled radical leaves, these with suborbicular, rather fleshy, glabrous, 3–7-crenate blades 3–5 mm. broad, the petioles pilose; stems ascending, filiform, nearly leafless, about 2-flowered, pubescent at the tip; bracts or cauline leaves linear, somewhat 3-toothed; flowers minute; calyx appressed, the corolla reduced.—In Peru, according to Prantl; cf. *R. Cymbalaria* Pursh, f. *hebecaulis* Fernald, Rhodora 16: 162. 1914.

Peru: Probably. Ecuador.

Ranunculus palimbifolius Wedd. Chlor. And. 2: 303. 1857.

Plants glabrate, 20-40 cm. high, few-leaved, 2–3-flowered; radical leaves long-petioled, the blades 4–8 cm. long, oblong, twice or thrice pinnatifid, the linear, pilose or glabrate divisions callous-tipped; upper cauline leaves sometimes entire; petals 5, yellow, obovate, obtuse, striate without, half again as long as the reflexed, villous sepals; anthers oblong; achenes numerous, compressed, the style nearly 2 mm. long.—Flowers the size of those of *R. acris.* Neg. 27656.

Cajamarca: At 3,300 meters (*Raimondi*). Ecuador.

Ranunculus peruvianus Pers. Syn. 2: 103. 1807; 301.

Perennial from long, fibrous roots, with a fibrillose caudex; stems slender, few-flowered, sparsely pilose; basal leaves long-petioled,

somewhat pilose, the few cauline leaves sessile, parted into entire, linear lobes; flowers conspicuously pediceled; calyx spreading, very villous; petals 5, yellow, streaked with red without, suborbicular, half as long again as the calyx; achenes ovate, compressed, smooth, the fruit head globose.—Illustrated, Deless. Icon. *pl. 37.*

Cajamarca: Between Cajamarca and Chachapoyas, 3,900 meters (*Raimondi*). Hualgayoc, grass steppes, 3,900 meters (Weberbauer, 271).—Without locality (*Jussieu*, type). Ecuador.

Ranunculus pilosus HBK. ex DC. Syst. 1: 287. 1818.

Stems ascending, dichotomously branched above, hirsute; radical leaves petiolate, ternate, appressed-pilose on both sides, 2.5 cm. long and 2 cm. broad or larger; leaflets incised-serrate, the lateral ones ovate-rhombic, entire or 2–3-lobed, the intermediate ones petiolulate, subrotund, 3-lobed or trifid like the terminal lobes; petioles pilose, 5 cm. long; cauline leaves deeply divided, the upper gradually more nearly simple; peduncle silky-pilose like the reflexed sepals, these 2 or 3 times shorter than the 5 or 6 petals; achenes beaked by the straight, persistent style, glabrous, compressed, obliquely subrotund-obovate, forming a globose head.—*R. erodiifolius* Gay, at least as to Herrera, apparently. Plant poisonous, with an acrid taste, killing rabbits that eat it (Herrera). Also in the Department of Apurímac, according to Herrera.

Amazonas: Chachapoyas, 3,000 meters, *Williams 7393.*—Cuzco: Valle de Urubamba (*Herrera 638*). Sacsahuamán, 3,500 meters, *Herrera 830.* Valle de Paucartambo, 3,500 meters, *Herrera 1047, 3368, 1406, 286.* Prov. Canchis, Sicuani, 3,550 meters (*Hicken*). Huasao, 3,200 meters, *Herrera 3021.* North to Colombia. "Sicuta," "chchapo-chchapo," "huarenccaiso," "cicuta."

Ranunculus praemorsus HBK. in DC. Syst. 1: 292. 1818; 302.

Perennial, nearly throughout with silky, appressed hairs, the caudex thickened with the remains of dead leaves; stems 1–2-flowered; leaves trisected, the segments obtusely incised-dentate, the medial ones petiolate; cauline leaves 1–2, 3-parted; flowers rather large; calyx reflexed, pubescent, exceeded by the 10–15 cuneate petals; achenes ovate, compressed, the fruit globose.—Var. *Bonplandianus* (HBK.) Wedd. is taller, slender, the leaves glabrate or glabrous above, the cauline pubescence subappressed. Plant used as a caustic (Raimondi). The Wilkes Expedition specimen was determined by Gray as a variety of *R. Bonplandianus* HBK., without assigning a name, but with the description "upper leaves pubescent, pilose

also above; stems decumbent or reclining and flowers as large as those of *R. acris.*" Low forms like *Isern 2220* seem to approach *R. sibbaldioides.*

Lima: Baños, *Wilkes Exped.*—Cuzco: (*Gay*); (*Herrera 106*). —Puno: Sandía, grass steppes, 2,500 meters, *Weberbauer 597.* Carabaya, *Raimondi.*—Junín: Palca, *Isern 2220.*—Cajamarca: Nanchó, Cutervo, *Raimondi.*—Ancash: Cajatambo, *Raimondi.* Bolivia to Colombia. "Yerba centilla," "Solimán," "huarancayza," "cienta."

Ranunculus repens L. Sp. Pl. 554. 1753.

Creeping, nearly glabrous or more or less pubescent; leaves palmately 3-parted, the roundish lobes deeply 3-lobed and serrate, frequently variegated or spotted with white; flowers 2 cm. broad or broader, the sepals spreading only in fruit; achenes mostly beaked by the short, recurved, usually persistent style.—Introduced from Europe.

Junín: Tarma, 3,100 meters, shaded stream bank, *Killip & Smith 21904.* Widely distributed.

Ranunculus sarmentoso-repens Steud. Flora 39: 403. 1856.

Glabrous throughout, the sarmentose, creeping stems with diffuse, weak branches; leaves subfasciculate, small, coriaceous, rotund or rarely ovate, more or less cordate at the base, entire, 1.5 cm. broad; flowers small; achenes few, ovate, glabrous, scarcely mucronate.—Seems to be related to *R. humilis* Colla (Steudel).

Puno: Azángaro (*Lechler 1778*).

Ranunculus setoso-pilosus Steud. Flora 39: 404. 1856.

Stems low, branching, the well-petioled radical leaves pinnately dissected with obtuse, short, simple or denticulate lobes, setulose-pilose throughout; peduncle equaling or longer than the petiole, 1-flowered; flowers 12–15 mm. wide; sepals setulose-pilose, somewhat exceeded by the obovate, striate petals; achenes ovate, reflexed, acuminate, the style uncinate.—Stems weak, 4–6 cm. long. Probably the same as *R. praemorsus.*

Puno: Sachapata (*Lechler 2709*).

Ranunculus sibbaldioides HBK. ex DC. Syst. 1: 293. 1818; 303.

A low perennial, the solitary flowers seemingly sessile in the congested radical leaves, these petioled, pinnatifid, pilose beneath, the segments often 2 on each side, ovate or obovate, obtuse, incised-

dentate, subtrifid at the tip; flowers small; calyx spreading, the sepals pilose without, shorter than the oblong-obtuse petals; achenes ovate, subcompressed, smooth.—*R. Sprucei* Briq. of Ecuador has spreading pubescence, the petals 5–6 mm. long.

Junín: Yauli, 4,400 meters, *Weberbauer 277;* 221.—Huánuco: Punco, 4,050 meters, alpine grassland, *2473.* Ecuador.

Ranunculus Sodiroi Franchet, Bull. Acad. Intern. Geogr. Bot. 10: 209. 1901.

Roots fibrous, the ascending stem often rooting at the lower nodes; leaves tripinnate, glabrous, mostly radical, the very long petiole more or less villous; petals yellow, entire, longer than the reflexed sepals; achenes long-beaked, greenish brown and velutinous. —Suggests *R. acris* in appearance, but easily recognized by the leaves, composed of seven 3-lobed segments spaced regularly, all glabrous, and with divisions of equal size (Franchet).

Cajamarca: *Raimondi 3200.* Ecuador.

Ranunculus trichophyllus Chaix in Villars, Hist. Pl. Dauph. 1: 335. 1786. *R. aquatilis* L. vars. Wedd. Chlor. And. 2: 299. 1857.

Aquatic, usually somewhat pubescent, often with both more or less dilated floating and dissected immersed leavee, the formsr variously lobed, their stipular sheaths more pubescent, broader, and less completely adnate than those of the dissected leaves, the latter usually collapsing out of water; flowers generally 1–1.5 cm. broad; petals rarely contiguous, 3–9-veined, about twice longer than the calyx; stamens usually 10–12; carpels ordinarily 16–24; achenes to 1.5 mm., rarely to 2 mm. long, pubescent or glabrous; style tip usually deciduous, the remaining short beak subterminal or sub-lateral.—Very variable. Description based on Drew, Rhodora 38: 17. 1936.

Loreto: Pebas, *Isern 2267.*—Puno: Lake Titicaca, *Weberbauer 1365.* Chuquibambilla, 3,900 meters, in rivulet on puna, *Pennell 13400.* Temperate South and North America; Eurasia.

6. KRAPFIA DC.

Aspidophyllum Ulbrich; *Rhopalopodium* Ulbrich.

Caulescent or acaulescent, perennial herbs with fleshy leaves. Flowers medium-sized to very large, greenish or purplish to orange, the colored sepals 5–9. Petals thin, with 1 nectary. Stamen column fleshy and clavate.—Plants of moist, often limestone grasslands,

with one exception. With *Laccopetalum* they could be retained more conveniently in *Ranunculus* as sections of that polymorphic genus.

Leaves entire or toothed but neither lobed nor divided.

Petioles slender, not at all winged..... *K. clypeata.*

Petioles thick, winged.

Flowers purplish or roseate green or yellow; leaves, at least above, densely long-pubescent, conspicuously ligulate by the extended petiole wing.

Leaves glabrous beneath..... *K. Raimondii.*

Leaves more or less pubescent beneath, at least at first. *K. cochlearifolia.*

Flowers greenish yellow; leaves above short-pubescent; petiole wing not or not conspicuously extended..... *K. Herrerae.*

Leaves deeply toothed, lobed, or dissected, at least in part.

Lobes never pinnately dissected; some leaves sometimes merely toothed.

Petals with a stipe-like claw 1–2 cm. long, roseate; leaves glabrescent or beneath loosely pilose..... *K. Weberbaueri.*

Petals not or scarcely clawed, orange or yellow; leaves, especially beneath, more or less densely appressed-villous.

Leaves deeply 3–5-lobed, the lobes deeply toothed.

Sepals red; petals orange..... *K. Gusmanni.*

Sepals roseate; petals yellow..... *K. flava.*

Leaves more or less 3-lobed, but the lobes merely coarsely toothed..... *K. ranunculina.*

Lobes more or less pinnately dissected..... *K. Lechleri.*

Krapfia clypeata (Ulbrich) Standl. & Macbr., comb. nov. *Aspidophyllum clypeatum* Ulbrich, Notizbl. Bot. Gart. Berlin 8: 268. 1922.

Lower leaves 10 cm. long or longer, the blades 6–12 cm. long, 4–8 cm. broad, acutely serrulate, sometimes incised, silky-villous except in age; stems erect, villous, taller than the basal leaves, branching above and bearing terminal, solitary flowers 2–2.5 cm. broad; sepals 5, about 2 cm. long and broad, yellowish green, silky-villous without; petals 5, broadly clawed, to 15 mm. long and broad, glabrous; nectary indistinctly limited; stamen column about 8 mm. high.—Related technically to *K. Raimondii.* Ulbrich at one time in Herb. Berlin referred this plant there, but since, in his later

judgment, it constitutes a separate genus on the basis of its ligneous roots, greenish sepals, and ligneous pericarp, I have not felt free to take up his herbarium name.

Huánuco: Above Muña, 3,800 meters, *Weberbauer 6728.*

Krapfia cochlearifolia (R. & P.) Standl. & Macbr., comb. nov. *Ranunculus cochlearifolius* R. & P. ex DC. in Deless. Icon. Select. 1: 10. 1820. *R. macropetalus* DC. Prodr. 1: 29. 1824. *Rhopalopodium cochlearifolium* Ulbrich, Notizbl. Bot. Gart. Berlin 8: 263. 1922.

Very similar to *K. Raimondii* and probably not specifically distinct; leaves, petiole wings, and ligule one-third to one-half smaller.—Illustrated, Hook. Icon. *pl. 1821.* Neg. 27651.

Huánuco: Above Muña, 3,800 meters, *Weberbauer 6729;* (*Pearce 525*).—Junín: Huancayo, 4,200 meters, *Weberbauer 6684.*—Without locality, *Ruiz & Pavón* (type).

Krapfia flava (Ulbrich) Standl. & Macbr., comb. nov. *Rhopalopodium flavum* Ulbrich, Notizbl. Bot. Gart. Berlin 8: 260. 1922.

Similar to *K. Gusmanni,* but the rosulate basal leaves often more deeply 3–5-lobed, the upper strongly reduced; stems erect, the solitary flowers 2.5–3 cm. broad, the outer segments dark rose, the inner pale yellow; nectary with small lateral plicae.—Mossy, boggy places.

Huánuco: Above Muña, 3,500 meters, *Weberbauer 6790* (type). Tambo de Vaca, 3,900 meters, *4349* (det. Ulbrich).

Krapfia Gusmanni (HBK.) Standl. & Macbr., comb. nov. *Ranunculus Gusmanni* HBK. Nov. Gen. & Sp. 5: 43. 1821. *Rhopalopodium Gusmanni* Ulbrich, Notizbl. Bot. Gart. Berlin 8: 258. 1922.

Basal leaves 3-parted or lobed, the lobes more or less toothed but never pinnately dissected; flowers typically 3–6 cm. broad, often more than one; sepals and petals mostly 5, the latter scarcely clawed; fruit and stamen column subequal; nectary plane.—Some of the plants are var. **Weberbaueri** (Ulbrich) Standl. & Macbr., comb. nov. *Rhopalopodium Gusmanni* var. *Weberbaueri* Ulbrich, loc. cit., with leaves glabrate above and flowers 2–3 cm. broad. Illustrated, Wedd. Chlor. And. 2: *pl. 82b* (typical); Deless. Icon. 1: *pl. 35.* 1820 ("to var. *Weberbaueri*" Ulbrich).

Cuzco: Valle del Paucartambo, 3,700–4,700 meters, *Herrera 2336, 2329.*—San Martín: Moyobamba, *Stuebel 50a.*—Amazonas: Above Balsas, 3,500 meters, *Weberbauer 4293* (type of var.).—Junín: Near Yurac-yaco, *Raimondi* (det. Ulbrich).—Huánuco: Southeast

of Huánuco, 3,300 meters, *2161.*—Puno: Agapata to San José, *Raimondi* (det. Ulbrich).—Without locality, *Weberbauer 6790.*

Krapfia Lechleri (Schlecht.) Standl. & Macbr., comb. nov. *Ranunculus Lechleri* Schlecht. ex Steud. Flora 39: 406. 1856. *R. Gusmanni* var. *Lechleri* Wedd. Chlor. And. 2: 304. 1857. *R. haemanthus* Ulbrich, Bot. Jahrb. 37. 404. 1906. *Rhopalopodium haemanthum* Ulbrich, Notizbl. Bot. Gart. Berlin 8: 257. 1922.

A low, stemless or nearly stemless plant with basally rosulate, 3–5-parted leaves; flowers subglobose, about 2 cm. broad, the reddish sepals 6–9, the shortly clawed petals 5–6; fruit head globose.—This small or diminutive plant is easily recognized by the shaggy pubescence and finely divided leaves. The stem is more or less developed, rarely to 14 cm. high. Illustrated, Weberbauer, 206. Neg. 27647.

Junín: Yauli, 4,600 meters, *Weberbauer 286.* Alpamina, 4,500 meters, *Weberbauer 5101.* Morococha, *Hauthal 372.* Cerro de Pasco, *Sawada 87.*—Puno: Sangabán (*Lechler 2216*). Bolivia.

Krapfia Raimondii (Wedd.) Standl. & Macbr., comb. nov. *Ranunculus Raimondii* Wedd. Chlor. And. 2: 305. 1857. *Rhopalopodium Raimondii* Ulbrich, Notizbl. Bot. Gart. Berlin 8: 262. 1922.

Basal leaves to 60 cm. long or longer, the broadly oval or orbicular blades about 20 cm. long, the petiole wings 4–7 cm. broad, sometimes elongate-ligulate (to 7 cm. long and 6 cm. wide), permanently silky-pubescent above; flowers 6–8 cm. broad, the sessile, suboblong sepals 5 cm. long, the broadly obovate-cuneate petals somewhat longer and narrowed to a claw 1 cm. long; sepals and petals purplish green.—A magnificent plant. Raimondi and Weberbauer have explained the common names as referring to the folk custom of tossing the flowers to the mouths of children who were slow to talk.

Huancavelica: Asapara, 4,200 meters, *Weberbauer 6684.* Prov. Pataz, 4,000 meters (*Raimondi*).—Huánuco: Tambo de Vaca, *Raimondi;* 3,900 meters, wet, rocky uplands, *4902.* "Rima-rima," "lima-lima."

Krapfia ranunculina DC. Syst. 1: 228. 1818. *Ranunculus Gusmanni* var. *Krapfia* Wedd. Chlor. And. 2: 304. 1857. *Rhopalopodium ranunculinum* Ulbrich, Notizbl. Bot. Gart. Berlin 8: 260. 1922.

Similar to *K. flavum,* but the basal leaves not parted, the pubescence sparser, the leaves of the 1–2-flowered, slender stems bract-

like, and the flowers yellow, the outer parts finally brown.—Illustrated, Deless. Icon. 1: *pl. 35.*

Junín: Huacapistana, 3,400 meters, *Weberbauer 2248.* Huasahuasi (according to Delessert).

Krapfia Weberbaueri (Ulbrich) Standl. & Macbr., comb. nov. *Rhopalopodium Weberbaueri* Ulbrich, Notizbl. Bot. Gart. Berlin 8: 261. 1922.

Basal leaves 3–5-parted above the middle, with the strongly sheathed base 10–30 cm. long or even longer, the thick blades glabrous above, reniform or suborbicular; stems erect, their 1–3 leaves greatly reduced; flowers terminal, solitary, to 5 cm. broad, the 5–6 outer segments 4–4.5 cm. long, the inner 1.5–2 cm. long, to 2–3 mm. broad; nectary elongate-sulcate, with sharply differentiated, circular border.—Related to *K. Gusmanni* and allies. The native name, according to the collector, means "speak, speak."

Huánuco: Near Monzón, 3,400 meters, *Weberbauer 3339* (type). —Junín: Andamarca, *Raimondi* (det. Ulbrich, form with leaves in part merely toothed).—Ancash: Above Huaraz, 4,200 meters, *Weberbauer 3745.* "Rima-rima," "lima-lima."

7. LACCOPETALUM Ulbrich

Leaves sinuate-serrate. Flowers solitary, the leathery, nearly orbicular sepals much longer than the deeply pitted, fleshy petals. Fruit heads globose.—Technically separated from *Ranunculus* and *Krapfia* by the many and deep nectar pores in the petals. See Ulbrich, Notizbl. Bot. Gart. Berlin 8: 271–272. 1921. A decoction of this beautiful plant is said to be used in Peru as a remedy for throat and pulmonary affections, and, according to Weddell, the inhabitants feed the plant to breeding cattle as an excitant and to assure fecundity. Since this author confused this species and *Krapfia Raimondii* (cf. Ulbrich), these uses may be shared with the latter and similar forms.

Laccopetalum giganteum (Wedd.) Ulbrich, Bot. Jahrb. 37: 404. 1906. *Ranunculus giganteus* Wedd. Chlor. And. 2: 30. 1857–62.

Basal leaves to 70 cm. high; cauline leaves 1–3 and 6–8 cm. broad; flowers greenish, 10–15 cm. broad; sepals 5 (–6), 8–10 cm. long, 6–8 cm. broad, the pores 2–4 mm. broad; carpels glabrous, scarcely 1 mm. long.—Var. *insignis* Ulbrich has flowers to 10 cm. broad, petals less densely fimbriate, basal leaves shorter (to 45 cm. long) and wider

(to 17 cm. wide), with few coarser, fimbriate teeth.—Illustrated, Weberbauer, 269, and Ulbrich, op. cit. 405, 406.

Cajamarca: Between Cajamarca and Hualgayoc, 4,100 meters, *Weberbauer 4224*. Prov. Pataz, *Raimondi*.—Ancash: Cordillera Pelagatos, 4,200 meters, *Weberbauer 7020a*. "Huamanripa," "pacra," "pagra," "pacra-pacra."

8. MYOSURUS L.

A small annual of very wet places, marked by its linear leaves and spike-like receptacle.—Besides the following, *M. minimus* L., widely dispersed, may be expected as an introduction and may be known by its nearly filiform leaves and generally spurred petals.

Myosurus apetalus Gay, Fl. Chile 1: 130. 1845.

Leaves linear; petals none; sepals shortly spurred.—Treated by Huth as a variety of *M. aristatus* Benth., a later published name. Illustrated, Gay, Atlas *pl. 1*.

Peru: Probably. Chile.

9. CALTHA L.

Reference: Hill, Ann. Bot. 32: 421–435. 1918.

A small, glabrous, tufted, rather fleshy plant, well marked by its leaves that bear at the base prominent appendages. Sepals petal-like. Follicles dehiscent along the ventral suture.

Caltha alata Hill, Ann. Bot. 32: 428. 1918.

About 2 cm. high. from an elongate, fleshy root; petioles 1 cm. long, amply vaginate below; blades shortly cordate-sagittate, 6–8 mm. long and broad, obtuse or retuse, more or less sinuate-margined; appendages erect, wing-like, oblong, obtuse, arising from the leaf base near the midrib; peduncle about 1.5 cm. long; perianth segments 5, ovate or elliptic, obtuse, yellow; carpels many, curved, erect, acutely beaked, mostly 6 mm. long; seeds about 6.—This is *C. sagittata* of authors in part, not Cav., a distinct species, as shown by Sir Arthur W. Hill, confined to the Magellanic region. It has been confused also with C. *andicola* (Gay) Walp., definitely Chilean. *C. involuta* Hill, op. cit. 427, of Ecuador, is to be expected; its broadly ovate- or cordate-sagittate leaves are 12–15 mm. long and the appendages are infolded from the leaf base, erect, and parallel to the midnerve. Illustrated, Wedd. Chlor. And. *pl. 83*.

Puno: Carabaya (*Weddell*). Agapata, *Lechler 1953*. Poto, between *Distichia* cushions (Weberbauer, 219). Bolivia.

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